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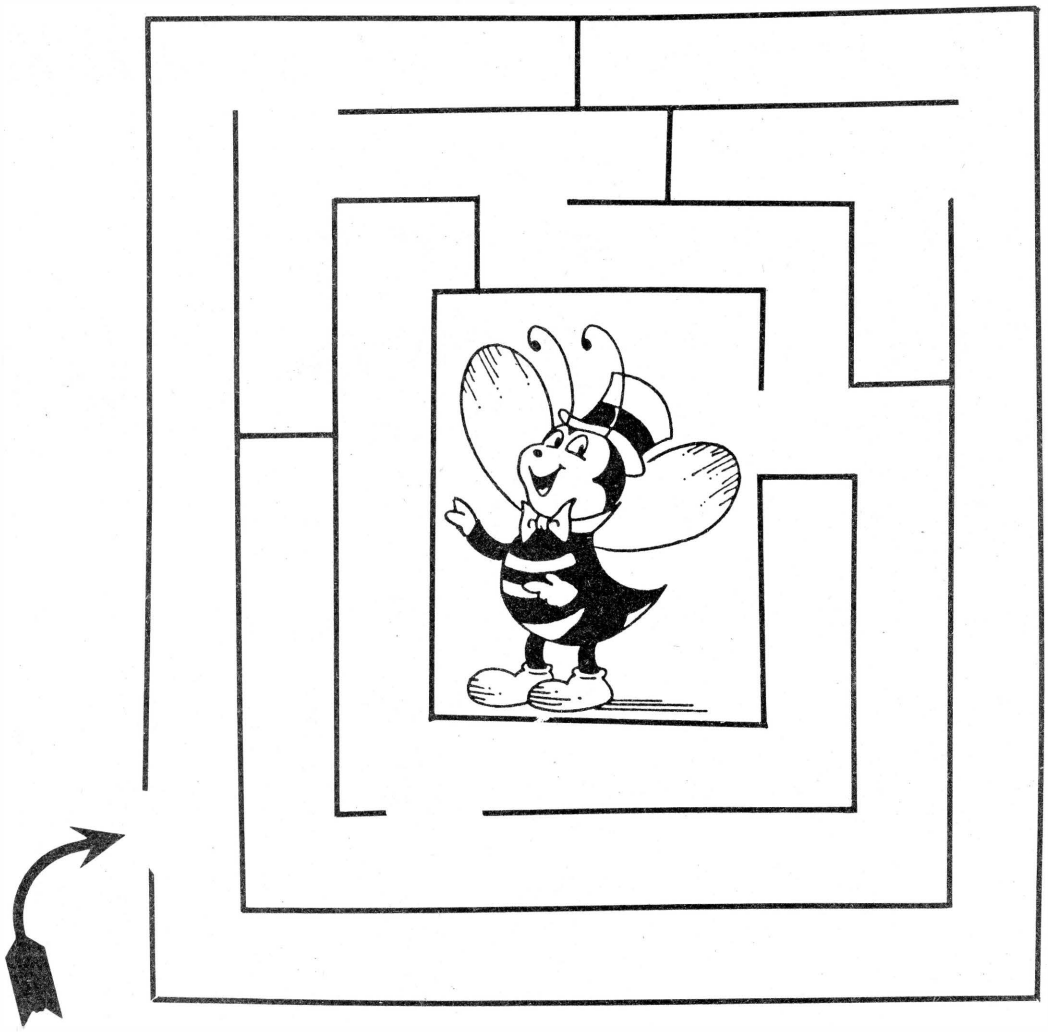
MICROpendium

Covering The TI99/4A Home Computer And Compatibles

Volume 3 Number 4 May 1986 $1.50 per copy



FIND THE BUG—see page 24

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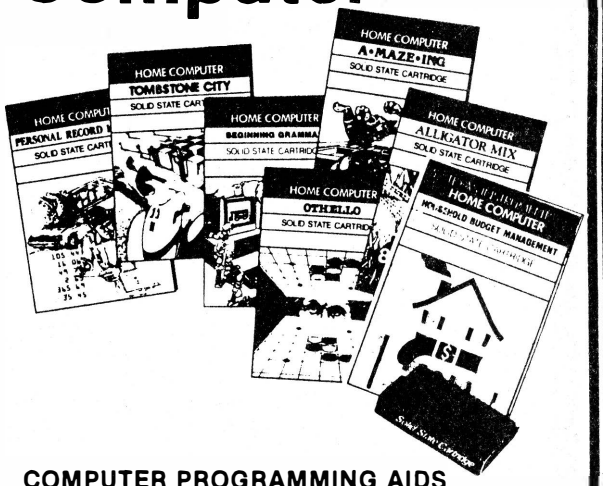

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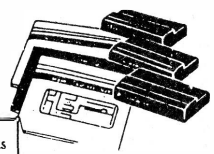

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John Koloen.....Publisher
Laura Burns.....Editor
Mack McCormick....Technical Editor

Coming next month

—Review of Maximem
—Error handling in Extended BASIC
—Review of the Horizon RAM Disk

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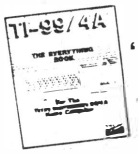

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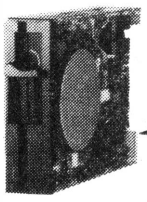

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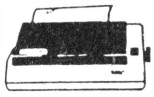

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Comments

Still working on the mail

Your mailing label looks different, because we customized our mailing program, and though this has advantages, we may not have all the bugs out yet.

For one thing, four-line addresses are now compressed into three lines. This garbled some addresses, while in others, repetitions occurred.

The new program prints a shorter top line. We are beginning to revise our mail codes (at the request of some readers). Since the new program does not print the date your subscription began, we are changing the little codes that say "S5 " and the like to codes that give the month and year end of the subscription. The "S5 " stood for a subscription that began with May's issue, thus the new code would read "4/87" for the date of the last issue of the current subscription, April of 1987. We hope to have this completed in the next couple of months.

You may have noticed that you didn't get your renewal notice until February if your subscription was coded S2*, and then received another warning in March if you had not renewed by then. We have been behind in notification of expiring subscriptions for some time, but have preferred to let the subscriptions ride for an issue or two than to cut subscribers off without notice. Eventually we plan to catch up, but if we have been out a few copies to people who have not renewed, it is better to err in that direction.

Speaking of being behind—when we first started, we published each issue toward the end of the month before the cover date. Gradually this has inched forward and we are now publishing in the middle or toward the end of the month of the cover date. However, firmness in regard to deadlines has kept this situation from deteriorating any further. And as far as we know, we have kept to a regular schedule with a better record than any other TI-oriented magazine in history.

ABOUT GRAM KRACKER

Inside you'll find a review of GRAM Kracker by Millers Graphics. Although I wrote it, I'm not happy with it. I found it very difficult to squeeze everything in. Left out were such details as how I actually use it on a day-to-day basis. My primary use for it is as a cartridge storage device, downloading from disk TI-Writer, Extended BASIC, Editor/Assembler and Microsoft Multiplan when needed. I don't think I described how easy this is, nor that it takes far less than a minute to download any of these cartridges. Next month we'll have a review of a similar product from Canada called MAXIMEM. The following month we hope to have a review of yet another similar product, GRAM-KARTE from Germany.

NEW PRODUCTS COME OUR WAY

A number of new products have been or on the verge of release. Recently we received a copy of BRAIN by Datax. This is a multi-functional program featuring a five-operation calculator, routines to convert four number base systems, tables for ASCII codes, help screens, routines for financial and real estate investment and more. There are 24 menus arranged in a tree-like pattern. Also, we've received copies of Computer War, Submarine Commander and River Rescue. Also, we've been promised delivery of a mouse for the 99/4A. More to come next month.

—JK

Reviewed in MICROpendium

1984

February: B-1 Nuclear Bomber, Tandon TM-100 Disk Drive, Void, Beanstalk Adventure, Microsurgeon, On Gaming, Database 500

March: Star Trek, Escape From Balthazar, Garkon's Getaway, Sky Diver, Mail-Call, Prowriter 8510 Printer

April: Monthly Budget$ Master, Budget Master, Home Budget, Thief, Donkey Kong, Khe Sanh

May: Companion Word Processor, Q*Bert, Mad-Dog I & II, Programs for the TI Home Computer

June: Creative Expressions Accounts Receivable/Accounts Payable, CDC 9409 Disk Drive, Starship Concord, Lost Treasure of the Aztec, ASW Tactics II

July: Theon Raiders, Introduction to Assembly Language for the TI Home Computer, Game of Wit, Pole Position

August: TE-1200, Tower, Galactic Battle, Galaxy

September: Wycove Forth, 99/4 Auto Spell-Check, QUICK-COPYer, Wizard's Dominion, Anchor Automation Mk XII Modem

October: Killer Caterpillar, ZORK I, Defender

November: 9900 Disk Controller Card/Manager, Super Bugger, Transtar 120S printer, Floppy-Copy, Data Base-X

December: Gravity Master, Data Base Manager System, Learning 99/4A Assembly Language Programming

1985

January: Super Sketch, Foundation Computing 128K Card, PTERM-99, TI-Runner

February: Super Extended BASIC, Beginning Assembly Language for the TI, ZORK II

March: Morning Star Software CP/M Card, WDS/100 Winchester Disk Drive, Sketch Mate, BMC Color Monitor

April: 9900 Micro Expansion System, Disk + Aid, Gemini 10X-15X

May: Character Sets and Graphics Design, Draw 'N Plot

June: GRAPHX, DATA BASE I

July: Acorn 99, Advanced Diagnostics

August: Model Dow-4 Gazelle, TI-Artist, PC-KEYS, Not-Polyoptics' Bankroll

September: Midnite Mason, Myarc 32K/128K Card, GRAPHX Companion

October: 4A/TALK, Extended BASIC II Plus, XB Detective, Console Writer 2.1

November: Foundation Z80A/80-column cards, 9900BASIC, Adventure Editor

December: Display Enhancement Package, Triple Tech

1986

January: BITMAC, Starcross

February: Night Mission, Peripheral Diagnostic Module, BA-Writer

March: Super Duper, Tunnels of Doom Editor, Business Graphs 99

April: U.S. Open Tennis, PRBASE

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An example of the speed is a benchmark program that appeared in the January, 1985 issue of Compute Magazine: "MSX is Coming" by Tom Halfhill. The program does a bubble sort on an array of 150 elements. The times in minutes:seconds are:

SST *Expanded Basic* (Integer Arithmetic)	0:31	Apple II plus	6:24	TRS-80 Color Computer	8:01
		Apple IIC	6:33	Commodore 16	8:35
SST *Extended Basic* (Floating Point Arithmetic)	2:05	Commodore Vic-20	6:34	Commodore Plus/4	8:36
		IBM PC jr.	6:59	Atari 800XL	8:55
IBM PC	5:45	Commodore 64	7:02	Atari 800	9:00
Goldstar MSX	6:20	Commodore 8032	7:16	TI 99/4A Basic	12:58

Many commands will be directly compiled, however some changes will be required to compile an existing program.

The following is a list of commands found in the ***SST*** *EXPANDED BASIC COMPILER.*

Floating point: + - * / ABS ATN COS EXP INT LOG SIN SQR TAN LET INPUT IF INTER FLOAT DIM

Integer: + - * / ABS LET INPUT IF PRINT FOR-NEXT DIM DISPLAY FLOAT INTER COLOR CHAR VCHAR GCHAR KEY CLEAR PEEK PEEKV LOAD POKEV OPEN CLOSE LINKER SCRON PRINTAT INPUTAT RESETAT INSTRINGA OUTSTRINGA POS SEG VAL LEN SOUND ADDSTRING STR CHR ASC FLOATIN FLOWOUT SUBIN SUBOUT PLOTMODE PLOTCHR PLOT GPLOT USING UNUSE SIG JOYST SPRITEMODE SPRITEA MOTIONA SCHARA PATTERNA COLORA LOCATEA POSITIONA MAGNIFYA DELSPRITEA DISTANCEA COINCA SCREEN SCROLL RANDOMIZE RND SCREENON USERA-USERE

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Feedback

Saving headaches

I have a bit of information that might save others a few of the headaches I experienced while trying to get the CorComp Triple Tech card to function properly with the solid state speech synthesizer. The main problem lies with the combining of various third party hardware with the original TI equipment and then trying to figure out all the little bad habits it acquires.

The article you did on the Triple Tech (Dec. '85) was fine as far as describing the card, but it dealt little with the card's operational quirks. The one that plagued me the most was not being able to use the "OPEN#1:"SPEECH",OUTPUT" command in a program without the system giving me an I/O fault. After swapping out the voice card with the same results, I found that if you are using the CorComp disk controller card (DDC), in order to run a program that calls on the speech function, you must first bypass the disk controller card by pressing the space bar twice. This same little fault popped up back when you were running the articles for the Super-Cart.

If there is someone who has figured out why the CorComp DDC functions in this manner, I would very much be interested in knowing why.

Glenn D. Knight
SSgt, USAF
Osan AB, Republic of Korea

Other programs will initialize diskettes

I would like to respond to Colin Lee's letter to Feedback (April 1986). The reason Disk Manager takes so long to initialize a diskette is because it verifies the disk. The actual initialization process takes place before the sector numbers appear on the screen; these numbers appear as each sector is checked. Therefore, interrupting the process before the numbers reach 360 should cause no problems. But, there are programs that initialize diskettes without verifying them. One is "Disk Manager 1000," which is a freeware program. (And, you don't have to exit the program constantly!) I hope I have been of help.

Carlo Angelico
Philadelphia, Pennsylvania

Freeware comments

Since I placed my BBS program in the "Freeware" section of your magazine I have made many new friends and have had quite a success with helping others set up "Techie" BBSs. There are at least 30 running that I know of.

However, I have also learned that there are many people out there who take the hard work of others for granted. Here are some problems I have run into. I hope this letter will make certain people think about the service that these authors provide and whether they want it to continue.

The major problem I have run into is that many people are impatient about receiving their "Freeware" program back from the author. I have received nasty letters and phone calls for not returning software quickly.

We, the "Freeware" authors, cannot possibly have the turn-around time that software companies have. We are people who enjoy programming our computers in our free time but have other commitments such as jobs, school, kids, spouses and, we hope, writing more software.

Sometimes reasons for not receiving software also include:

A) The person requesting the software did not send postage (which most authors then pay from their own pocket)

B) Many people do not include a letter even telling the author what it is that they want. They just send a disk and hope he can guess!

C) The post office has been known to lose mail, and perhaps the request never made it to the author.

D) Some authors do not have easy access to a post office, and when a request comes from a foreign country the author must go fill out an international certificate explaining what is in the package.

I have had all these problems and others, such as disks which would not initialize, people telephoning my house at 3 a.m. and people who would get on the phone and ask me questions for more than an hour.

Here are a few guidelines in hopes of helping other "Freeware" authors. When requesting "Freeware" programs always:

1. Send a self-addressed stamped mailer. The author does not need to spend time or money for stamps, mailing labels and readdressing your package.
2. Send the correct number of disks he has asked for and initialize them. No one needs to spend time initializing disks. (People requesting my Techie BBS should send one disk, not four.)
3. Always include a cover letter specifying what it is you want and describing your system.
4. Respect the author's privacy. Don't call him late at night or early in the morning. Remember, he may be in a different time zone than you are!

If we all follow these guidelines perhaps we will see much more "Freeware" to come.

Monty Schmidt
Madison, Wisconsin

A riddle

What munches grass and crunches numbers? Why, it's a "Cowputer"—of course.

Jeff Speeth
Port Allegany, Pennsylvania

Initialization, sector verification

In response to Colin Lee's suggestion of a fast disk initialization (Feedback April '86) I have an explanation to what is actually going on.

The clicking of the drive 40 times is the actual initialization of the disk and what comes after that is verification of each sector to determine if all sectors are good and lock off any bad sectors

(Please turn to Page 10)

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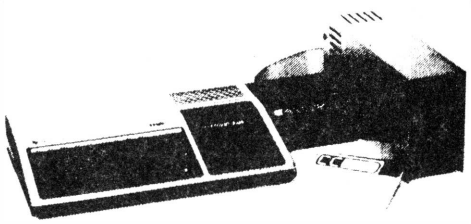

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Feedback

(Continued from Page 8)

so they cannot be used. If you have ever seen the message USED 1 instead of USED 0 after initializing a disk, what has happened is that the computer found a bad sector and locked it off and subtracted 1 from the total of sectors that are available. Aborting before the end of verification only eliminates the verification process, which is what takes up so much time. (Some disk managers, such as DM1000, have the option of selecting whether you wish to verify the disk.)

If you are going to store very important data on a disk I would recommend going through verification, particularly if you are using "cheap" disks. However, when the computer writes to a disk, it checks to make sure the data was written properly, and if it hits a sector that is bad, it will come back with an error message. You would then need to save that data onto another disk along with the remaining programs and re-initialize the bad-sectored disk, allowing it to be verified to make sure that a sector is not physically defective.

If a sector is defective, it will be locked off and the disk will be perfectly OK to use. (Sometimes a sector will go bad anyway, although it originally passed verification. This could happen because of excessive use of the disk such as on a BBS or coming in contact with a magnetic field.)

Nine times out of 10 you will have no trouble with not verifying disks, but I usually verify my disks for the extra insurance, especially if I am using single-sided disks and formatting them double-sided, in which case the manufacturer does not guarantee the other side to be error-free.

Gary Cox
Memphis, Tennessee

Speak & Spell help

The Speech Editor module adds speech capability to programs written in console BASIC. All of its features are included in the Extended BASIC module. The Speak & Spell program can be modified to run from Extended BASIC by eliminating character sets 15 and 16 and modifying the 160-word vocabulary stored on disk. If some of these patterns are compared against those of the resident 300-word vocabulary of Extended BASIC, it can be seen that the patterns on disk have extraneous leading and trailing characters. These offending characters may be removed by simply replacing all occurances of:

CALL SAY (" ",STRING) with:
A$ = STRING :: GOSUB 1340
and adding this subroutine:
1340 L = LEN (A$)
1345 B$ = SEG$(A$,1,,L-1)
1350 CALL SAY (" ",B$)
1355 RETURN

Those unsure of this procedure may send the original Speak & Spell disk with a self-addressed prepaid return mailer in an envelope to: Northcoast 99ers (Euclid, Ohio), Attn: Ken Gladyszewski, President, 9496 Jackson Street, Mentor OH 44060.

Ken Gladyszewski
Mentor, Ohio

Approach to TI-Writer

One major disadvantage of our computer is its limit of 40-column display. WYSIWG (What You See Is What You Get) display is cumbersome on the TI. My approach to using TI-Writer is as follows, and may prove of interest to some readers.

I set the margins at 0 and 39 in the Editor mode to begin with. This prevents the display from flopping back and forth in front of my eyes, something I have found very distressing. After the document is composed and edited, one approach would be to reset the margins as they should be on the printed version and then to reformat the whole thing prior to printing with the PF utility. I don't do that since it can take a long time with a several-page document.

I prefer to use the formatter to do all the work for me. After a little practice, all the codes become second nature, and I automatically include them while composing the original. I then run the document through the formatter, but not directly to the printer. I have a Myarc RAM disk, so I just direct the formatter output to the RAM disk rather than to the printer. This goes very fast. You could direct it to a floppy as well, but at some loss of speed. I then use a very clever 64-column scroller program to view the formatted document. If it is just like I want it to be, I load it back to the TI-Writer Editor and print it using PF to PIO.LF. This whole process goes very quickly, allows me to see exactly what the finished document will look like, and best of all, the computer does all the work, just like computers are supposed to.

The scroller is available in several versions from Jurgen Switalski, 218 Lake St., Northville, MI 48167.

Bernhard F. Muller
Milan, Michigan

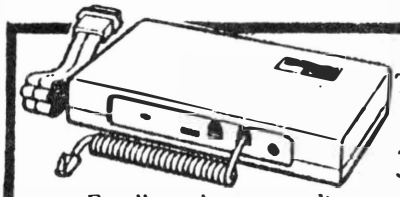
80 columns plus?

I am looking for a TI-Writer update that will handle more than 80 column lines in all phases of word processing including printing. If there is no TI upgrade, please refer me to a good third-party publisher for such a program.

R.T. Duggan
Fort Lauderdale, Florida

I am not sure what you mean by handling more than 80-column lines, but TI-Writer will do that via the formatter. Set the left margin at zero and the right margin at 132 and it will print out 132-character lines using compressed type. We would appreciate a user note from readers who would like to expand on this topic.—Ed

The Feedback column is for readers. It is a forum to communicate with other readers. The editor will condense excessively lengthy submissions where necessary. We ask that writers restrict themselves to one subject for the sake of simplicity. Our only requirement is that items be of interest to persons who use the TI99/4A home computer. Mail Feedback items to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.



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Building a 'super keyboard'

(or at least expanding the old one)

By TONY JOHNSON

This article will try to explain or at least give some ideas on how to expand or build a "real keyboard" for your 99/4 or 4A. Even though this is geared toward the technical side of the 4A, keep on reading. We'll try to get through this with as little pain as possible.

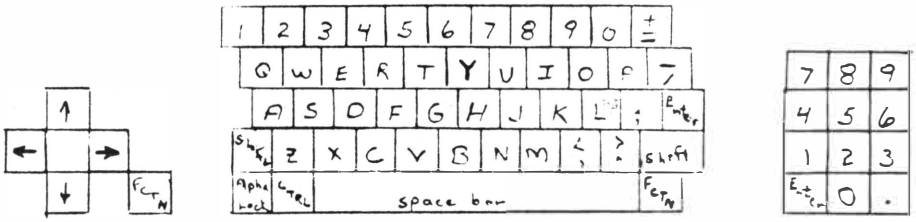
Though the 4A was my first home computer, it wasn't the first one I started working on. I got started on a mini-computer at work. Typing on the terminal and then coming home to work on the 4A was quite different. I thought that if the 4A keyboard was as close to the one at work, going from one to the other wouldn't be so painful and it might increase my typing skills. (I needed all the help I could get.) So my goals for the "super keyboard" were the following:

1) Separate numeric keypad.
2) Separate cursor controls.
3) A 10-key function bar above the main keyboard.
4) Special keys for OOPS, PAGE UP and DOWN, TAB, TAB ERASE, HOME, +, -, and BACKSPACE.
5) All function and control keys to be one-push vs the 4A "press FCTN and number 4."
6) Movable keyboard.

The layout of the keyboard was to match most other keyboards as closely aspossible. Fig. 1 is a photograph of the final keyboard. Let's start from the left and work our way across. The cursor pad has all four arrow keys along with PAGE UP, PAGE DOWN, HOME, INSERT and DELETE keys. The CTRL and TAB keys to the right side of the keyboard are also that of a standard keyboard. I have placed an OOPS and ALPHA LOCK in the upper left so as not to be confused with

Fig. 1

Fig. 2



the FCTN key. Above the number keys 1 to 0 there is a row of function keys. There are also function keys 11 and 12 for possible future use. In the center right, there is a TAB ERASE and BACKSPACE. On both sides of the space bar there are FCTN keys for easier typing. Next to the right set of cursor keys there is a BRK key. This is actually a FCTN 4 wired in parallel. In fact, most of the function keys are wired in parallel with the FCTN 1 to 10, i.e. INSERT, DELETE, ERASE, BREAK etc.

You may wonder why I have two sets of cursor keys. This is a matter of personal preference. The terminal that I use at work has them on the left side and most personal computer keyboards have them on the right. On the far right there is a numeric keypad with an ENTER, period, plus and minus keys. This makes inputting numeric data easier.

My first attempt at a keyboard was to take the 4A keyboard out of the console and put it into a larger box, add some cursor keys and a numeric keypad. The final result is shown in Fig. 2. The main keyboard is wired to the 4A by a three-foot ribbon cable.

(Please turn to Page 14)

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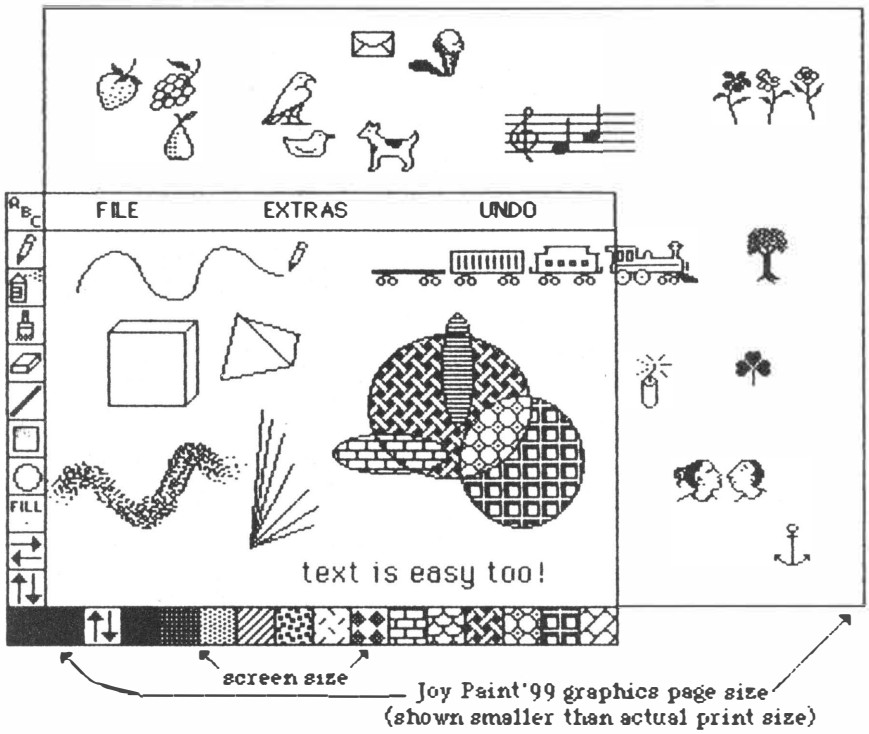

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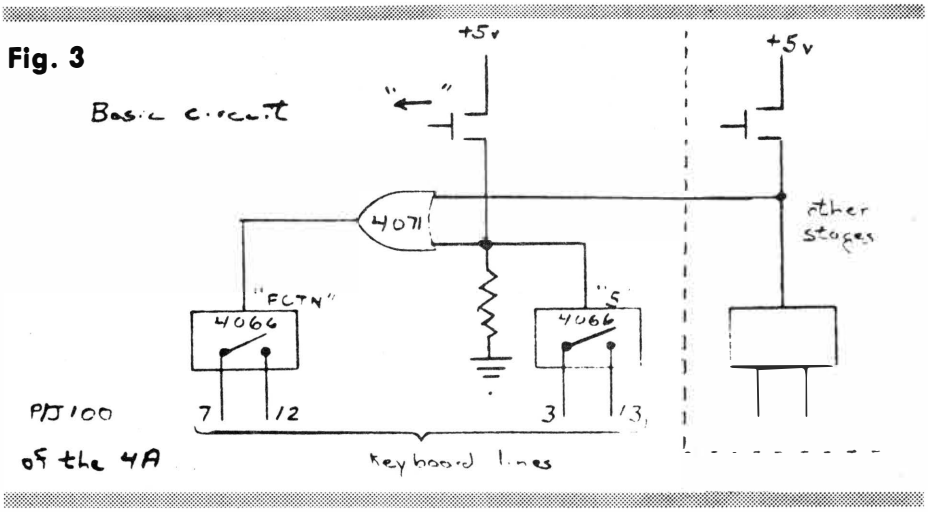
SUPER KEYBOARD—

(Continued from Page 12)

This allows me to move the keyboard around to suit my taste without affecting the expansion box cable going into the 4A. The numeric keypad is wired in parallel with the number keys. The key to the left of the "0" is wired to ENTER and one to the right is a "." key. The cursor keys are wired to the E, S, D and X keys. The fifth key is wired to the FCTN key so that the FCTN key may be pressed with the thumb. This was nice for a few months but there had to be a better way.

To build a "super" keyboard, you'll have to get a main keyboard, keys for the numeric keypad, cursor control, FCTN 1 to 10 and keys for special purposes. Single-pole single-throw (SPST) switches for these shouldn't be hard to find. If you are fortunate enough to find a full-size keyboard that uses SPST switches, get it. You'll recognize these by looking at the bottom of the keyboard. For each switch there will be two connections to the printed circuit board. Try to look for SPST, mechanical or contact switches in the description. Forget about using Mylar switches. They are nearly impossible to use.

Fig. 3



The interface electronics used here are for a SPST keyboard. If you get a SPST keyboard, then you'll have to cut traces to isolate the keys from each other and rewire the keyboard matrix. Get youself a good copy of 4A schematics to wire from. This will take some time but is well worth the effort.

The kind that you do not want are

(Please turn to Page 16)

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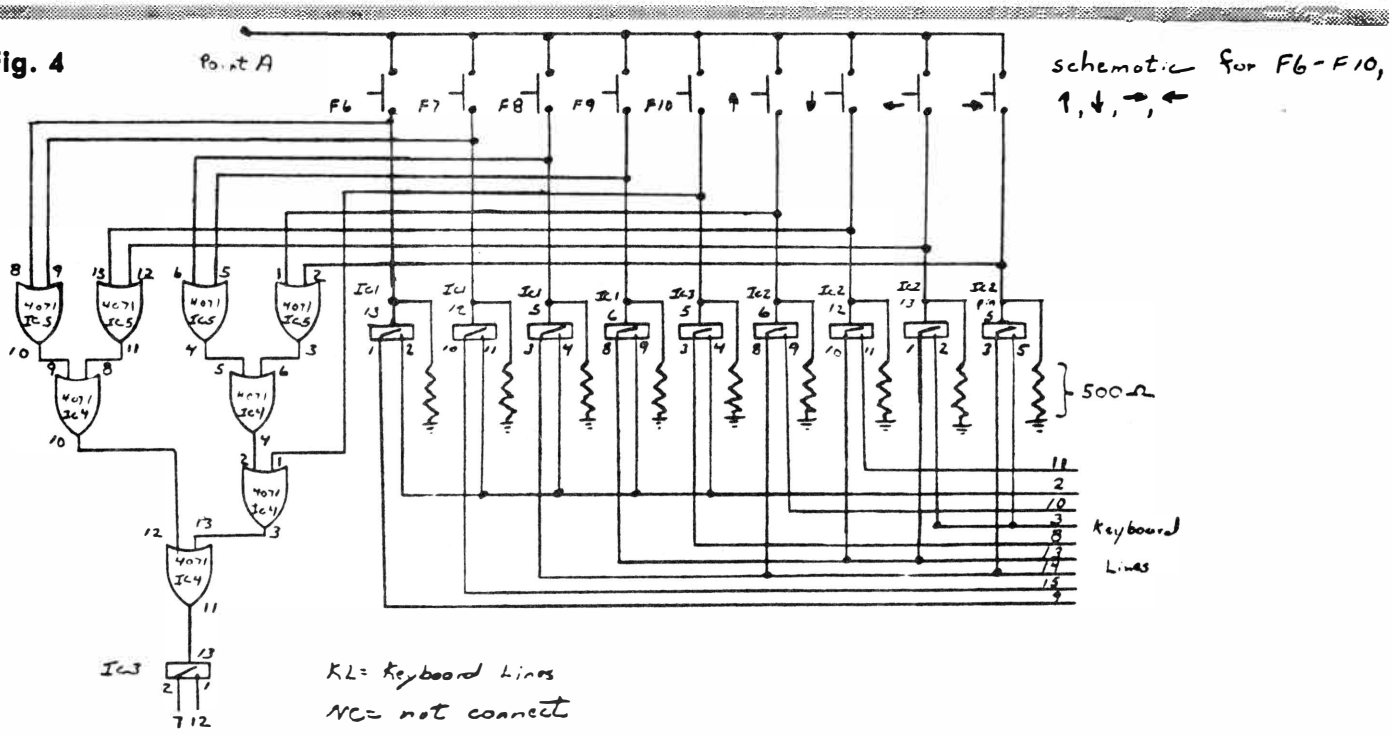
Fig. 4



SUPER KEYBOARD—

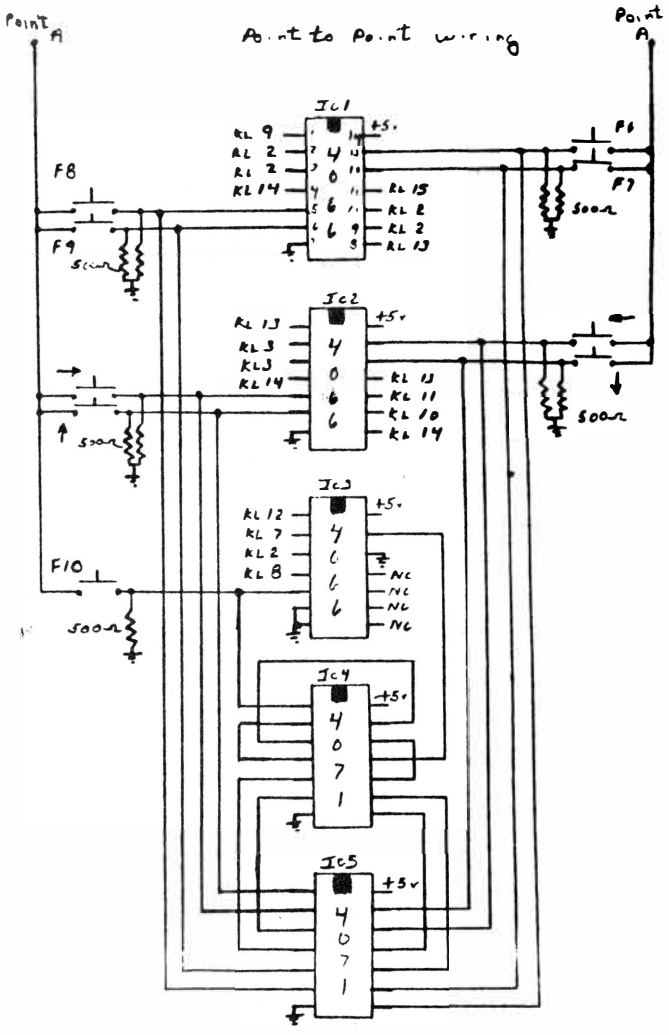
(Continued from Page 14)

Hall-effect switches. These will have four connections on the bottom. Most surplus keyboards are this type. Some of these keyboards have electronics that will output the ASCII equivalent of the key being pressed. Press an "A" and you'll get an ASCII 65 on the output. (Perhaps someone will design an interface that will use this type of keyboard.)

Once the mechanical part of the keyboard is built, we can get started on the electronics. The 4A uses a different encoding scheme than other computers. The 4A uses a TMS9901, which is used to provide interrupt and I/O ports to the TMS9900. The 9901 is wired directly to the keyboard and indirectly through a decoder chip. Instead of interfacing with the 9901 directly, the keyboard electronics will act like the array of switches. Press a "Q" and get a "Q", press the F1 key and both the FCTN key and "1" switch close.

The integrated circuits (IC) used are fairly common ones: a 4066 and 4071. These types of chips are CMOS, which are sensitive to static electricity. Take care in handling the parts. CMOS ICs were used because of their low current draw and are fairly easy to find. When built, the keyboard will be powered from the 4A power supply. The 4066 are quad analog switches with an "on" resistance of approximately 250 ohms. This internal resistance will affect the 9901 circuit, but will be explained in a little bit. The 4071 are quad two input OR gates. The relays used are a bit hard to find. You can find double pole-single throw (DPST) relays just about anywhere but they should have high resistance coils to keep the current draw low. I used Magnecraft relays, W171DIP-25.

(Please turn to Page 18)



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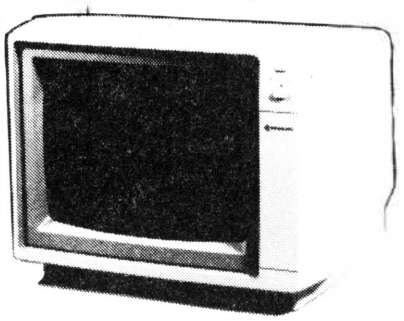

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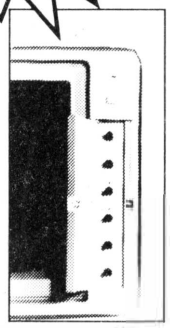
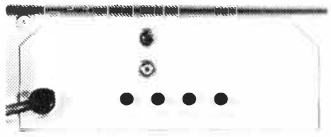


Rear Panel



Even turned off, this monitor looked different . . . its black matrix picture tube appeared much darker than the other monitors we compared it to, and its sleek contemporary design and convenient front-panel controls made it stand out from the pack.

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SUPER KEYBOARD—

(Continued from Page 16)

The basic function of the keyboard switch is to allow a signal to pass from the decoder chip to the 9901. On the main keyboard this is not a problem. If you press an "A" you get an "A"; only one key needs to be pressed. The main function of the electronics is to act as if two switches are pressed, such as the case of FCTN, CTRL or SHIFT keys.

The basic circuit is pictured in Fig. 3. Pressing a key presents a high or a "1" on the control of the analog switches. This will turn on the switch and connect two keyboard lines together, in this case an "S." It will also connect two other lines, which are the function switch lines. With both analog switches turned on, you'll have the left arrow. When there are two or more function keys used, then the circuit must turn on the FCTN analog switch whenever one of the function keys is pressed. This is the purpose of the OR gates. This will allow any single function key to be passed through to the FCTN analog switch.

The complete circuit is in Figs. 4 and 5. All keys that use the function keys are in Fig. 4 and control and shift keys are in Fig. 5. The power is derived from the 4A. One end of the ribbon cable is connected to the +5 and ground of the keyboard circuit and the other end is connected to a "submini" male plug. The socket is connected to +5 and ground on the 4A mother board. This setup, along with the 15-pin connector for the keyboard, will let you quickly disconnect the keyboard from the 4A should you ever need to work on it.

Function keys 1 to 5 are special cases. When using only one analog switch on a line, the internal resistance will change the voltage levels of the circuit in the 4A. Not drastically but noticeably. When two analog switches are turned on at the same time and are

(Please turn to Page 20)

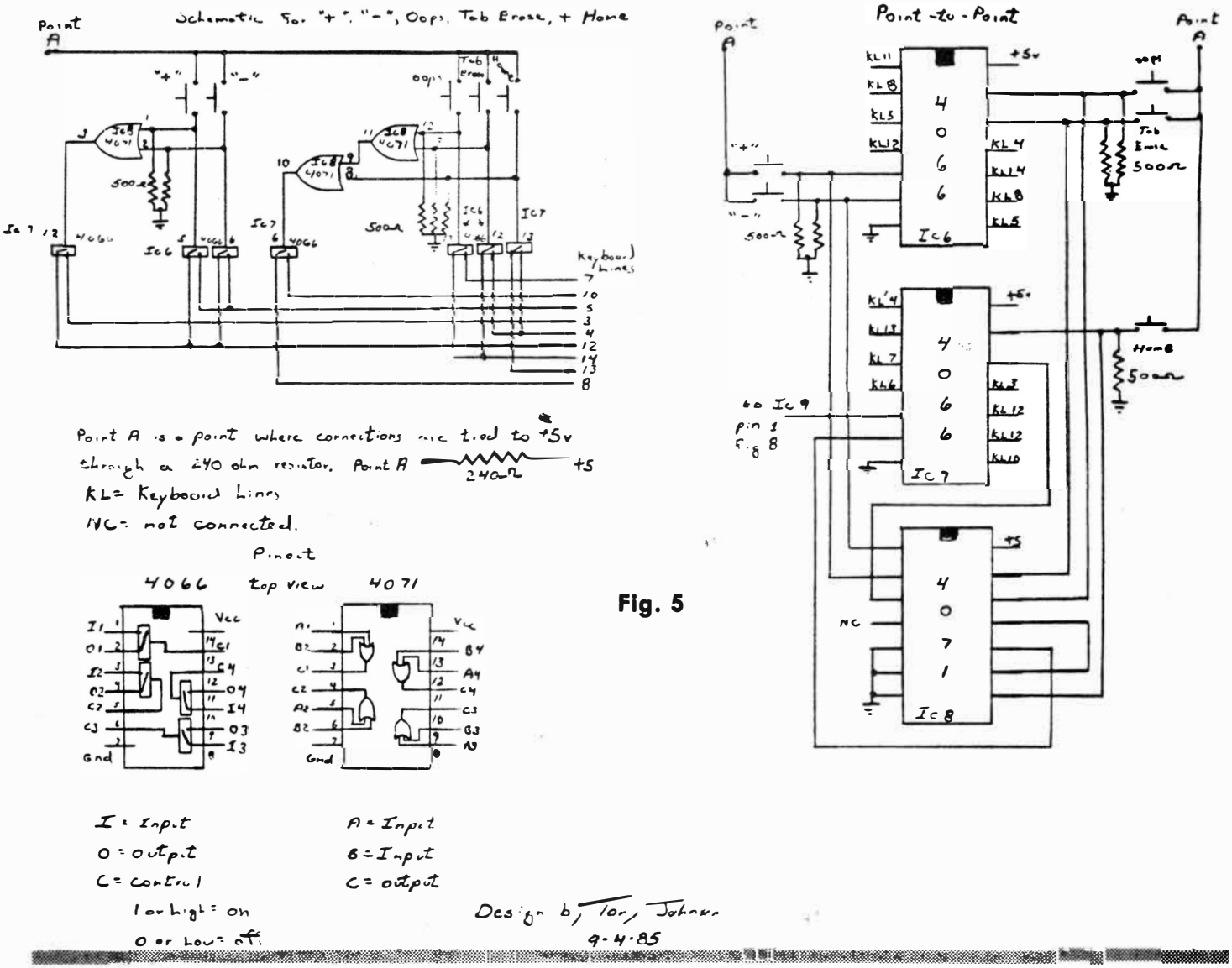


Fig. 5

SUPER KEYBOARD—

(Continued from Page 18)

on the same lines, it throws the timing and the levels of the signal off to the 9901 and it won't recognize the keys being depressed. The quickest and easiest way I found to avoid this problem was to use relays. Using relays, the resistance of the switch is zero and everything works fine. Actually, relays could be used for all keys that need two analog switches but the number of relays would be 19, and relays can get expensive. Using ICs reduces the parts count to 13, and decreases the current draw and cost of the project.

The circuit for FCTN 1 to 5 keys is depicted in Fig. 6. Since most keyboards are longer then they are wide, I suggest that you build the circuit inline as in Figs. 7A and 7B.

There is one other part of the circuit that needs explaining. If you get a keyboard without an ALPHA LOCK or a key that doesn't lock in an "on" position, then you'll need a circuit to toggle on and off. I decided to use an LED, some resistors and a 4013, a D-type flip-flop. The circuit is shown in Fig. 8. The flip-flop toggles the Q outputs either high or low, depending on the previous state. (Q- is just the opposite of Q. If Q is a "one," or a high, then Q- is a "zero" or a low.)

When the ALPHA LOCK switch is pressed, whatever was on Q-(either high or low) is clocked into the data input. If a high was on Q-, then it would be clocked into the chip and the Q- will toggle from a high to a low. The opposite will happen on the Q output. The Q output is tied to the LED for a visual indicator and to the analog switch that controls the ALPHA LOCK lines.

That's about it for the circuit. I am interested in hearing from readers who expand, build a keyboard or need help. I also would be interested in hearing about improvements to the circuit or errors that are found in the design.

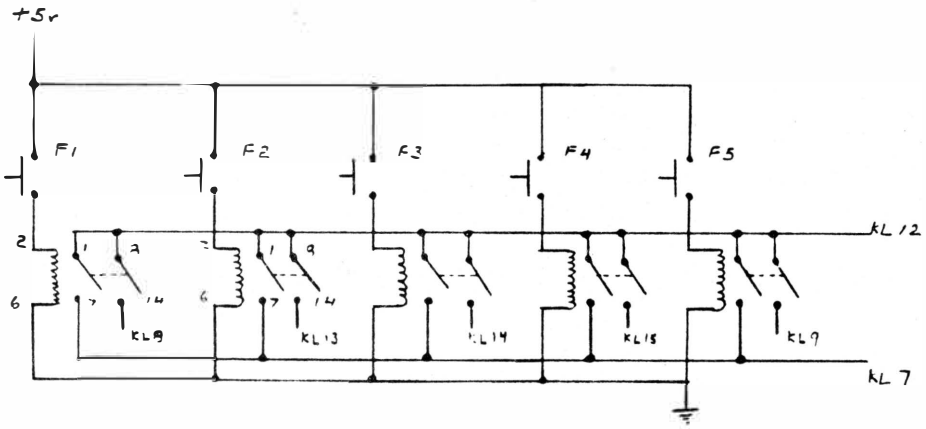
(Please turn to Page 22)

Fig. 6

FCTN 1 to 5

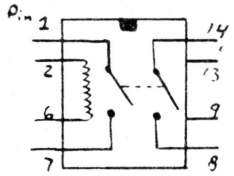
Point to point

schematic for FCTN 1 to 5

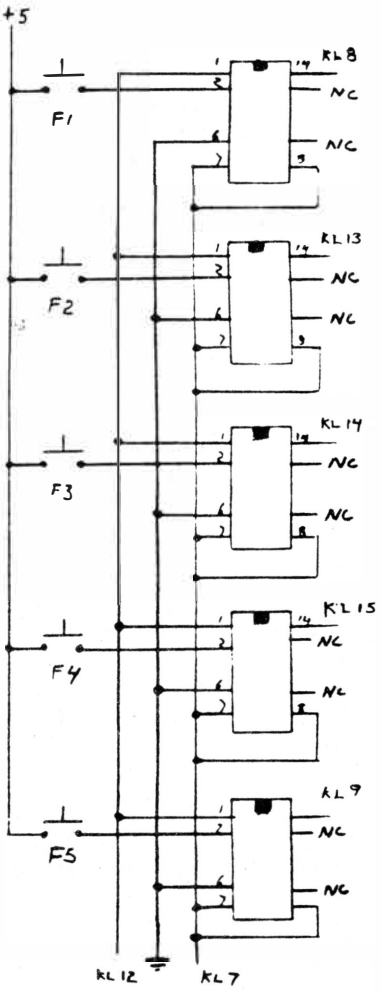


Relays used here are 5v 200Ω coils DPST (double-pole, single throw) KL= keyboard line NC= not connect

Pinout of Relay
top view



Design by Tony Johnson
9-4-85



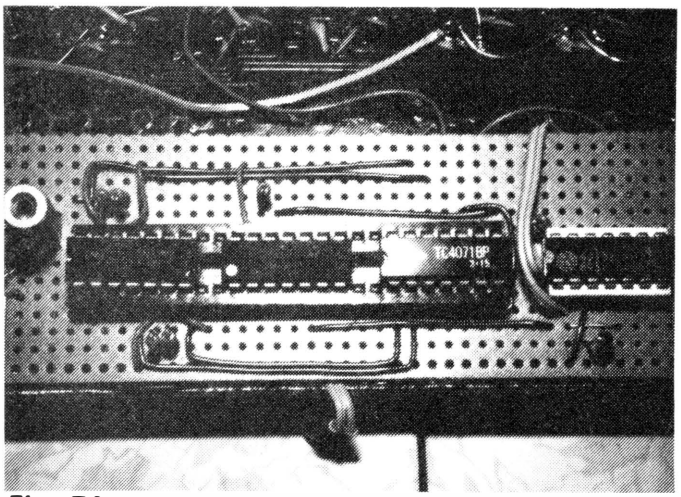


Fig. 7A

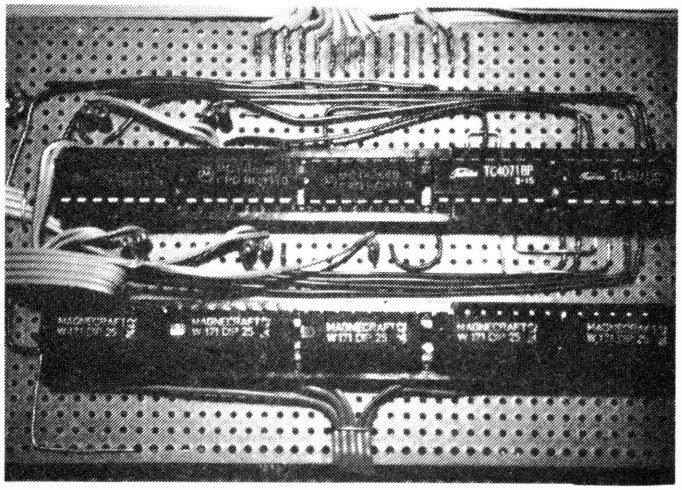


Fig. 7B

SUPER KEYBOARD

(Continued from Page 20)

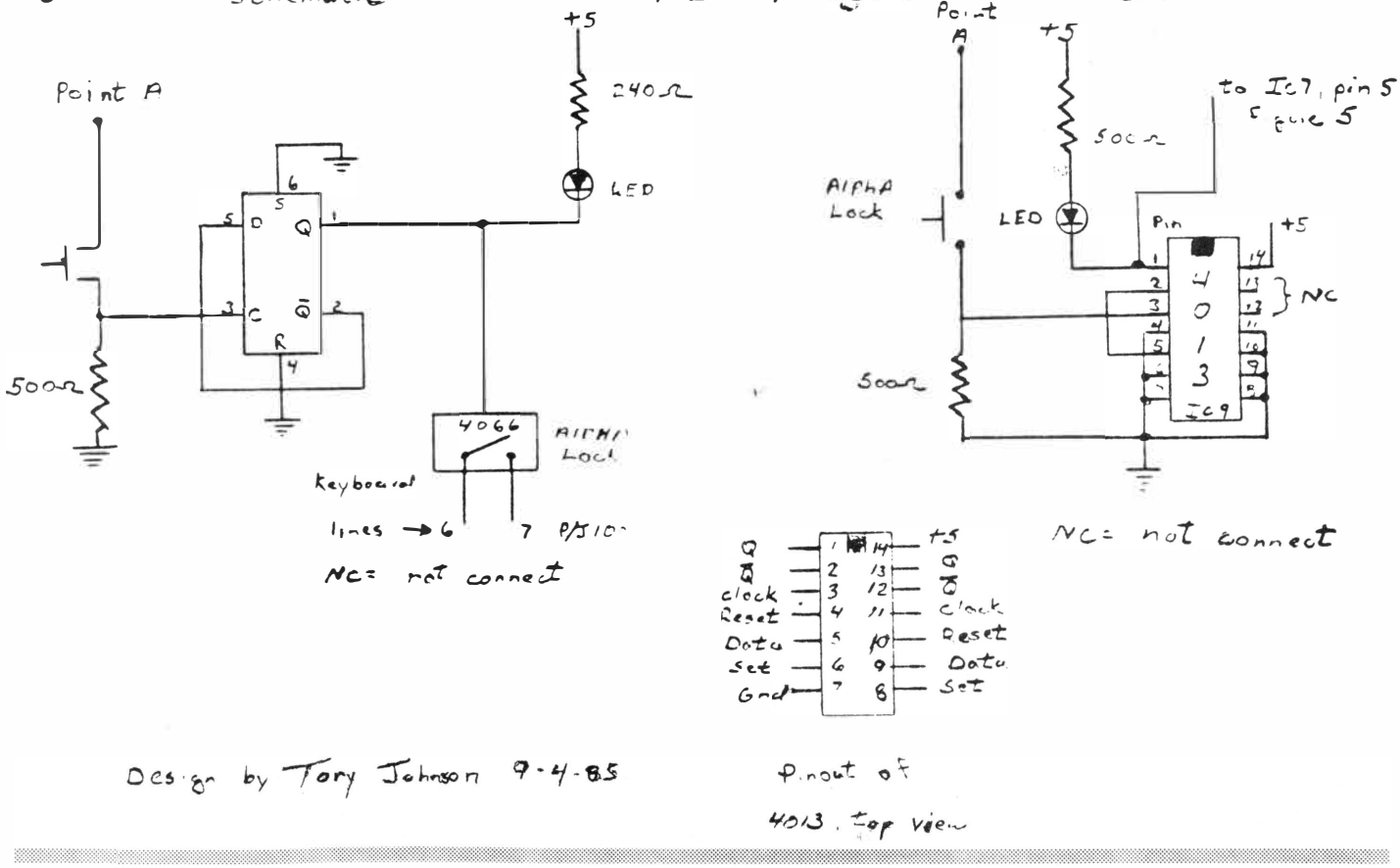
Even though I have made two "super" keyboards using this circuit, I cannot guarantee that it will work on all systems.

Johnson may be reached at 10507 Mellow Meadows, No. 6201; Austin, Texas 78750—Ed.

Parts list for the "super keyboard"

Five DPST (double pole single throw) relays
Five 4060 Analog switches
Three 4071 Quad dual input OR gates
One 4013 Dual D-type flip-flop
One LED (light emitting diode)
16 500-ohm resistors
One 240-ohm resistors
One 15-pin inline female connector
One 18-inch male "submini" plug
One 18-inch female "submini" socket
Miscellaneous IC sockets, ribbon cable (17 wires min.), perforated board, wire, solder etc.

Fig. 8



BASIC/Extended BASIC

It's time for the 'find-the-bug' quiz

By Lee Wilkerson

This month's column is a little bit different: a find-the-bug programming quiz. Right and wrong answers are not scored. The purpose of the quiz is to give your debug mode a workout, show a few differences between console BASIC and Extended BASIC and highlight some features, oddities and bugs in these languages. Note that I use TI Extended BASIC, version 110. Version 100, or third party X-BASICs might produce different results.

Consider the "program lines" below and decide which would create fatal errors, warnings or logical errors when used in a program. Some of the lines are OK as they stand; in those cases decide what the final value of X or X$ would be. Lines 1-10 are statements for either BASIC or X-BASIC; the rest are for X-BASIC only. Answers and explanations follow the quiz.

ANSWERS

Line 1: Arrays can have a maximum of three dimensions in console BASIC, so this will be rejected as an INCORRECT STATEMENT. It will be accepted by X-BASIC if the 32K memory expansion is in use and if it is preceded by OPTION BASE 1. Otherwise it would cause a MEMORY FULL error.

Line 2: This is OK for X-BASIC, but BASIC gives a BAD VALUE message, since it cannot change the colors of character set 0. X-BASIC can change the color of the cursor and edge characters.

Line 3: OK for BASIC, but not for X-BASIC, which cannot access character sets 15 and 16. The expression 44/3 evaluates to 14.6666, which is rounded to 15.

Line 4: OK for both BASIC and X-BASIC. Subprogram names can also be used as variable names, even though it may lead to confusion. In this case the computer will create two arrays named SCREEN (one dimension) and COLOR (three dimensions.)

Line 5: A defined function cannot reference itself, so this will not work. When BASIC calls the function, a MEMORY FULL IN 5 message is given. X-BASIC prints STACK OVERFLOW IN 5, plus an undocumented message, UDF REFS ITSELF, and the line number that called the function.

Line 6: Fine for either language. If A$ and B$ are identical, X will be assigned the value 1, otherwise it will be assigned 0.

Line 7: Also OK. The value assigned to X would depend on the values of A, B, C, and D.

Line 8: This line would assign X the value of 14 in either version of BASIC.

Line 9: Since the display is considered to be file -0, which is always open, this line is OK. However, it has no effect on output to the screen.

Line 10: This line is acceptable to the computer, since the variable names do not exceed the 15 character limit.

(Please turn to Page 26)

```
1     DIM X(3, 3, 3, 3, 3, 3, 3)
2     CALL COLOR(0, 49/3, 2)
3     CALL COLOR(44/3, 6, 2)
4     SCREEN(5) = COLOR(1, 6, 2)
5     DEF X = SQR(X)
6     X = ABS(A$ = B$)
7     X = A > B > C > D
8     X = 42/7/3/2++11++--22/11
9     RESTORE #0
10    FEDTAXDEDUCTION = MORETHANIEARNED
-----------------------------------------
11    PRINT :: :: PRINT
12    PRINT :: :: :: PRINT
13    PRINT THIS, THAT OR THOSE
14    X = 123 AND 45678
15    X = RND AND RND
16    X = MAX(MIN(1 OR 2)OR 3)0
17    ON X GOSUB 100, 200, 300 REM BRANCH
18    BREAK!
19    CALL DELSPRITE(#1, #2, ALL)
20    CALL COINC(ALL)
21    CALL SPRITE(#1, 42, 2, 1, 1, 125, 125) :: CALL COINC(#1, #1, 1, X)
22    FOR FORNEXT = NEXTTO TO FORNEXT :: NEXT NEXTTO
23    DISPLAY AT(10,15):"ENTER YOUR NAME:"
24    ACCEPT AT(25,29)SIZE(2):X$
25    CALL KEY(3, K, S) :: ACCEPT AT(10,1) SIZE(1) VALIDATE("yn"): X$
26    DISPLAY AT(10,1):PI :: ACCEPT AT(10,1) SIZE(-12) VALIDATE(UALPHA):X$
27    DATA 44, 86.2, 35.9, 91.1, 33.1, 55.5 ! DATA FOR PLOTTING
28    PRINT AT(10,1)SIZE(5):USING "##.####":44.12345, 99.12345, 18.16
```

FIND THE BUG—

(Continued from Page 24)

Line 11: A SYNTAX ERROR will be issued when this line is encountered.

Line 12: Beware! This error will lock up the system completely, and should be considered a bug in X-BASIC. I consider anything a bug if it causes a program crash, system lockup, erroneous results or improper program flow instead of reporting an error.

Line 13: The value of THIS will be printed, then in the next tab column the value of the logical OR of THAT with THOSE will be printed.

Line 14: BAD VALUE. The logical operators can only be used on values in the range -32768 to 32767.

Line 15: X will be either 0 or 1, since random numbers are generated in the range 0 to .999, and the logical operators round them either down to 0 or up to 1.

Line 16: SYNTAX ERROR again. Neither MAX nor MIN has two values to work with.

Line 17: As long as X has a rounded value from 1 to 3, no problem will be detected. If X is 4 or greater a SYNTAX ERROR will occur. Curiously, if the "remark" is made longer a NAME TOO LONG message will occur at any value of X. If a statement separator is added:

17 ON X GOSUB 100, 200, 300 :: REM BRANCH

a value greater than 3 will give a BAD VALUE message.

Line 18: No problem. The exclamation mark is for a tail remark, and it is not necessary to insert a space.

Line 19: This works fine, as long as "ALL" is the last argument, but there is no reason to do this.

Line 20: Beware! This will lock up the console. Remember to put a numeric variable after the "ALL."

Line 21: This is a good example of X-BASIC's poor ability to detect coincidences of fast moving sprites. A sprite is always coincident with itself, but this line will only report it about 63 percent of the time on my system. Even with a tolerance of 35 the coincidence is sometimes missed.

Line 22: NEXT WITHOUT FOR error. The last statement should be NEXT FORNEXT. This is also an example of terrible choices for variable names. If you examine the FOR statement you will notice that the loop will execute a maximum of once, no matter what the initial values of the variables.

Line 23: This works, but not as intended. The string is too long to fit in the space between column 15 and 28, so it is displayed at row 11, column 1.

Line 24: This also works, but input will be at row 1, column 1. The row and column values are used modulo 24 and 28, respectively.

Line 25: Nothing can be entered, ex-

(Please turn to Page 28)

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Fowler releases TIBBS as freeware

Ralph Fowler, author of the TIBBS bulletin board system, has released his latest version of the program as freeware.

He says that he is taking the action "since software piracy has gotten so rampant."

Fowler says he has sold the program unprotected and encouraged changes and "a lot of programmers have taken my program and made a few changes, so that my program was the model for several bulletin board programs."

He notes that he has changed to freeware because he would "rather see the program in use and have people not be afraid to put my name on it so people will know whose program it is."

He adds that he "never wrote the program to make money."

The current version, V5.0, which includes XMODEM protocols, is the last one he is automatically sending out to sysops, though they will have priority among persons writing in for revisions, he says.

Persons wishing new versions, he says, can get one from someone who has one or by sending three single-sided, single-density disks or one double-sided, double-density disks. Disks must be formatted for either CorComp or Myarc format and senders must include a postage-paid, pre-addressed mailer. Address is

(Please turn to Page 38)

FIND THE BUG—

(Continued from Page 26)

cept a null string by hitting RETURN. A CALL KEY statement with a key value of 3 can interfere with a subsequent ACCEPT statement, no matter what is in the VALIDATE clause. Hitting the "n" or "y" keys will only return uppercase characters. A CALL KEY statement with a key value of 3 will produce an error on the TI 99/4.

Line 26: If you hit return when this is executed, X$ will be assigned the string " 3.141592654", even though only uppercase alpha characters (UALPHA) are specified as acceptable. VALIDATE only checks keyboard input, not default values displayed on the screen.

Line 27: This may be OK, but only if the last item is read in as a string ("55.5 ! DATA FOR PLOTTING"). Tail remarks cannot be put on DATA statements.

Line 28: Only the first of the three values will be printed. The SIZE clause in a PRINT USING statement can cause problems like this.

from Mechatronic

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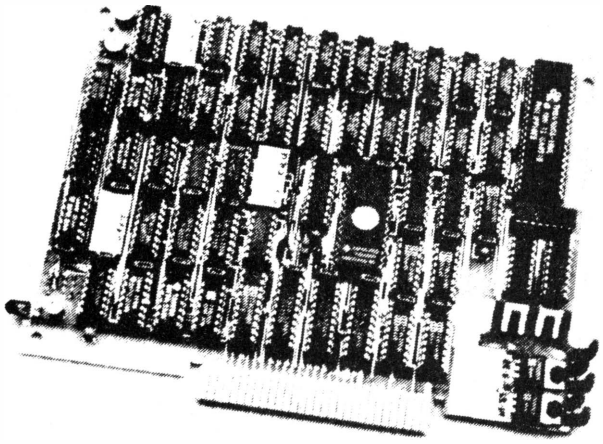

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FORTHFONT characters for labels

By HOWARD H. ARNOLD

In the March issue of MICROpendium, we discussed a progbram for designing fancy fonts to be printed on your Epson type printer in its graphics mode. This month we'll review a Forth program for printing ¾'' by 3½'' gummed labels using your homemade fonts.

Screens 62 through 69 do the printing job. The variables listed on screen 62 are mostly buffers for storing data to be transferred to the printer. Once data is entered into these buffers and the printer file opened, Forth permits a single block move of the buffer contents to the printer. The variable SER# on this screen is not used as a buffer. This variable simply stores the next number to be used in serializing the labels. Also XL is used as a simple variable for storing the X position (row #) of a letter being printed.

The technique used for loading the buffers is illustrated in the word INIT. The word first places a series of decimal numbers on the stack, then loads them into the buffer with a DO loop. INIT loads the START buffer used for setting the printer to 8 dot line spacing; GR used to set the printer to graphics mode, 376 dots wide; and FEED used to generate a line feed and carriage return. The words BGN, GRP, FD and CRO perform the block transfers of these control characters to the printer.

On screen 63 we have the word GETTXT which prompts for entry of up to 28 characters of data to be printed on the label below the graphic title, storing the ASCII characters in buffer TXB. GETTTL accepts keyboard entry of nine characters to be printed as graphics text on the label. These ASCII characters are stored as an array

(Please turn to Page 31)


```
SCR #62
  0 ( PRINT GRAPHIC LABELS)          DECIMAL
  1 0 VARIABLE START  4 ALLOT 0 VARIABLE GR  2 ALLOT
  2 0 VARIABLE FONT 106 ALLOT 0 VARIABLE BF 78 ALLOT
  3 0 VARIABLE FEED 0 VARIABLE XL 0 VARIABLE LABF 972 ALLOT
  4 0 VARIABLE TXB 34 ALLOT   0 VARIABLE SER#
  5 : INIT 8 65 27 10 13 5 0 DO START I  + C! LOOP  ( LINE SP=8)
  6        1 140 76 27 4 0 DO GR I + C! LOOP  ( LABEL = 396 DOTS WD)
  7        10 13 FEED C! FEED 1+ C! ;  ( LINE FEED & CR)
  8 : BGN START BF 5 CMOVE 5 WRT ;  ( SET LINE SPACING)
  9 : GRP GR BF 4 CMOVE 4 WRT ;     ( PRINT GRAPHICS)
 10 : FD FEED BF 2 CMOVE 2 WRT ;    ( LINE FEED AND CR)
 11 : CRO FEED BF 1 CMOVE 1 WRT ;   ( CARRIAGE RETURN ONLY )
 12 -->
 13
 14
 15

SCR #63
  0 ( GRAPHICS LABEL CONT)
  1
  2 : GETTXT CLS 0 0 GOTOXY ." Enter Text for Label" CR TXB
  3    32 BLANKS TXB 28 EXPECT ;
  4 : GETTTL CLS 0 0 GOTOXY  ." Enter Title for Label" CR
  5          PAD 9 EXPECT 3 0 DO -1 8 DO PAD I + C@ 64 - DUP ( A=1)
  6   0 < IF DROP 0 THEN -1 +LOOP LOOP ;  ( 3 sets char on stack)
  7   ( Row# Ltr# -- Add)
  8 : ROADD 128 * SWAP 30 * + 1024 /MOD 40 + BLOCK + ; ( Font Add).
  9   ( ....Ltr# Row# -- )
 10 : GETFNT 9 0 DO DUP ROT ROADD SWAP DUP 324 * I 36 *
 11    LABF + + ROT OVER 30 CMOVE 30 + 6 0 DO DUP I +
 12   ( ...Ltr# --)  0 SWAP C! LOOP DROP LOOP DROP ; ( Get 1 row)
 13 : GETLAB CLS GETTTL 3 0 DO I GETFNT LOOP ; ( Put Font in LABF)
 14 -->
 15

SCR #64
  0 ( GRAPHICS LABEL CONT)
  1 : PRTX 9 0 DO LABF XL @ + BF 36 CMOVE
  2   36 WRT 36 XL +! LOOP ;  ( PRINT 1 ROW OF GRAPH CHARS)
  3
  4 : PD BF + C! ; ( PUT DATA IN BUFFER)
  5 : TL 36 0 DO 208 I PD LOOP ; ( ELEMENTS FOR TOP LINE)
  6 : LC TL 208 223 192 192 255 255 6 0 DO I PD LOOP ; ( O/WRTE TL)
  7 : RC TL 255 255 192 192 223 208 36 30 DO I PD LOOP ; ( O/WRT )
  8 : SP 36 0 DO 0 I PD LOOP ;
  9 : LX SP 0 255 0 0 255 255 6 0 DO I PD LOOP ;   ( O/WRTE SP)
 10 : RS SP 255 255 0 0 255 0 36 30 DO I PD LOOP ; ( O/WRT SP)
 11 : LL 36 0 DO 11 I PD LOOP ;
 12 : LLC LL 11 251 3 3 255 255 6 0 DO I PD LOOP ; ( O/WRT BL)
 13 : LRC LL 255 255 3 3 251 11 36 30 DO I PD LOOP ; ( O/WRT BL)
 14
 15 -->

SCR #65
  0 ( GRAPHICS LABEL CONT)
  1 : TOP LC 36 WRT 9 0 DO TL 36 WRT LOOP RC 36 WRT FD ; ( TP BORD)
  2 : TTL LX 36 WRT  PRTX RS 36 WRT FD ;    ( PRINT ROW OF TITLE)
  3 : BLNK LX 36 WRT SP 9 0 DO 36 WRT LOOP RS 36 WRT ; ( BLNK LN)
  4 : LTXT TXB BF 32 CMOVE 32 WRT ;  ( PRINT TEXT ON LABEL)
  5 : BOT LLC 36 WRT 9 0 DO LL 36 WRT LOOP LRC 36 WRT FD ; ( BT BD)
  6 : ?DIG 48 - DUP 0 < IF DROP 0 THEN DUP 9 > IF DROP 0 THEN ;
  7 : GETSER CLS 0 0 GOTOXY ." Enter Start Ser #" CR PAD
  8   2 EXPECT PAD 1+ C@ DUP 0 > IF ?DIG PAD C@ ?DIG 10 * + SER# !
  9   ELSE DROP PAD C@ ?DIG SER# ! THEN ; ( CONV STRING TO # )
 10 : PTSR 30 0 DO 32 I BF + C! LOOP 35 BF 29 + C!  ( CONV TO STR )
 11   SER# @ 10 /MOD 48 + BF 30 + C! 48 + BF 31 + C!  32 WRT ;
 12 : LABEL FD GRP TOP 3 0 DO GRP TTL LOOP 0 XL ! GRP BLNK ( PRINT)
 13   CRO PTSR FD GRP BLNK CRO LTXT FD GRP BOT FD 1 SER# +! ;
 14 : RUN 5 66 LOAD INIT ." TURN PRINTER ON" BGN GETLAB
 15   GETTXT GETSER 0 DO LABEL LOOP 2 66 LOAD ;  ( PRINT # ON STK)


TI FORTH --- a fig-FORTH extension
```

FORTHFONT LABELS—

(Continued from Page 30)

index number (64 less than the ASCII value, but not less than 0); triplicated and left on the stack. ROADD locates the address in Forths virtual memory at which the byte values for a particular row of a particular character begin. GETFNT stores one row of byte values in buffer LABF. GETLAB calls GETFNT three times to get the three rows which comprise each character into the LABF buffer.

On to screen 64. PRTX prints one of the three rows comprising the graphic characters. The words PD through LRC load the byte values needed for printing segments of the label border into buffer BF.

Screen 65 starts to get down to the nitty gritty. The words TOP through BOT are the words that actually do a line of printing across the label. ?DIG verifies that the number entered for the starting serial number is indeed a numeric digit, else substitutes 0 for it. GETSER prompts for entry of a two-digit serial number. PTSR converts a serial number to a string. LABEL prints the border, graphics text, regular text and serial number. Finally, RUN is the user word that starts the whole operation, printing a number of labels equal to the number on the stack preceding the word RUN.

Screen 66 is the file setup procedure for opening and closing the printer file. If a 5 is on the stack preceding the command 66 LOAD, the commands on lines 5 and 6 open the printer file as PIO.CR.LF. If a 2 is on the stack preceding the same command, the commands on lines 2 and 3 are executed, closing the file and calling the HELP menu.

OK. You've got the hardest part now—we'll look at a special disk-mailer printing program next time, again using the graphics printing capability to warn off the postal folks from beating up your disks.

Note: The author is still offering both the source code and a binary image of FORTH-FONT from the March issue, this program and the disk mailer code as Freeware. Send $5 for disk, postage and handling to Howard Arnold, 210 Beech Valley Rd., Lewisville, NC 27023.

Module Emulator set

Pilgrims' Pride announces Module Emulator by John Keown, expected to be available June 1.

The Module Emulator is said to enable the user to back up modules on a disk and run all his module through a single module.

The Module Emulator requires a TI-99/4A console, 32K memory expansion, single disk drive and the 6000+ module, which is also available from Pilgrims' Pride.

Optional are the Myarc 128K or 512K memory expansion card, multiple drives in any configuration and the Navarone Widget cartridge port expander.

The Module Emulator and the 6000+ module sell for $69.95. The Module Emulator alone sells for $25.95.

For further information, or to order, contact Pilgrims' Pride, 5 Williams Lane, Hatboro, PA 19040 or (215) 441-4262.

Structured BASIC programming

Ready to program

By EMILE VERKERK

Having finished our HIPO chart and pseudocode, we are now ready to start programming. Before we rush madly to our consoles to start typing in lines of BASIC, there are a few rules we should take time to observe and understand.

The first rule states that each module has one entry point and one exit point. In order to accomplish this we GOSUB to each module and we RETURN from each module. Due to constraints built into TI BASIC (no DO WHILE structure) we are allowed to use GOTOs, as long as we use them within a module. This has the effect of controlling branching within the program to a local area (each module). This rule also helps keep modules independent of each other so that maintaining, improving and debugging are greatly simplified.

The second rule states that there are three control structures we may use in structured programming, the sequential structure, the IF THEN ELSE structure, or the DO WHILE structure.

The sequential structure states that each instruction is executed by the computer in the order that it is written. This means keep the flow of logic in each module sequential, except where a GOTO must be used.

The IF THEN ELSE structure is used for decision-making, but should not be used to branch out of a module. Unfortunately, TI BASIC has only a limited IF THEN ELSE structure; this makes our job even more difficult.

The DO WHILE structure is not available in TI BASIC. However, we do have the FOR NEXT loop structure. This structure should be used whenever possible to shorten the amount of program statements.

Following these two programming rules should invariably lead to better, easier to understand programs, and faster development time. (It took me 20 minutes to design the checkbook program and five hours to write and debug it).

The following program is presented, not for a blind typing in session, but for your understanding of structured programming techniques. The program is written in TI console BASIC, but can also be run in Extended BASIC.

Because I like the screen utilities (DISPLAY AT and ACCEPT AT) in Extended BASIC, I have included these functions in this BASIC program using the HCHAR and GCHAR utilities. Had I used the PRINT and INPUT statements, the screen would have scrolled up, which makes for a messy screen display.

Compare the program with your HIPO chart and pseudocode and see how easy it becomes to program using structured techniques.

Look over the checkbook program and count the REM statements. There are at least five before each module, giving an explanation of what the module does. These can be removed later using various utilities designed for that purpose, but should always be included in the master copy of your program. Should you decide to modify your program one year from now, it would be very difficult to do so if you didn't know what each module's function was.

Next, look at the variable names used in the program. Since TI BASIC affords us the luxury of using up to 15 characters to define a name, why not take advantage of it? DATE$(X) is certainly easier to understand than D$(X). The only time we use single letters as variables is for loop counters, but even then convention dictates we use X and Y.

Explanation of the program.

The main module has four lines. The first three are GOSUBs to each of the modules on our HIPO chart. The last line is a GOTO to handle the return from the end of job module.

In the initialization module, we initialize our variables, arrays and set up the program to handle various situations, whether we're using disk or cassette, whether we want to read in a file, etc. After having done all the initialization, we RETURN to the main module and GOSUB to the processing module.

As the processing module calls three other modules, there are three GOSUBs and a RETURN to the main module.

The end of job module asks if you wish to save your file. If you don't it asks if you wish to reconcile another account. If you do it RETURNs to the main module, else the program ENDs and returns you to TI BASIC.

All of the other modules have a specific purpose, the prepare for input module sets up the screen for inputs, the input module accepts the data into the program, the calculation module does any calculations needed in the program and the print module only does printing, whether to the screen or a printer.

The utility display module uses the HCHAR routine to emulate an Extended BASIC DISPLAY AT statement, while the utility input module is the CALL KEY routine so that we can use keyboard input.

As you have probably noticed, there are some modules that have only REM statements and a RETURN statement. These were left intentionally that way so that in the next article we can take our checkbook program and enhance it by adding file handling.

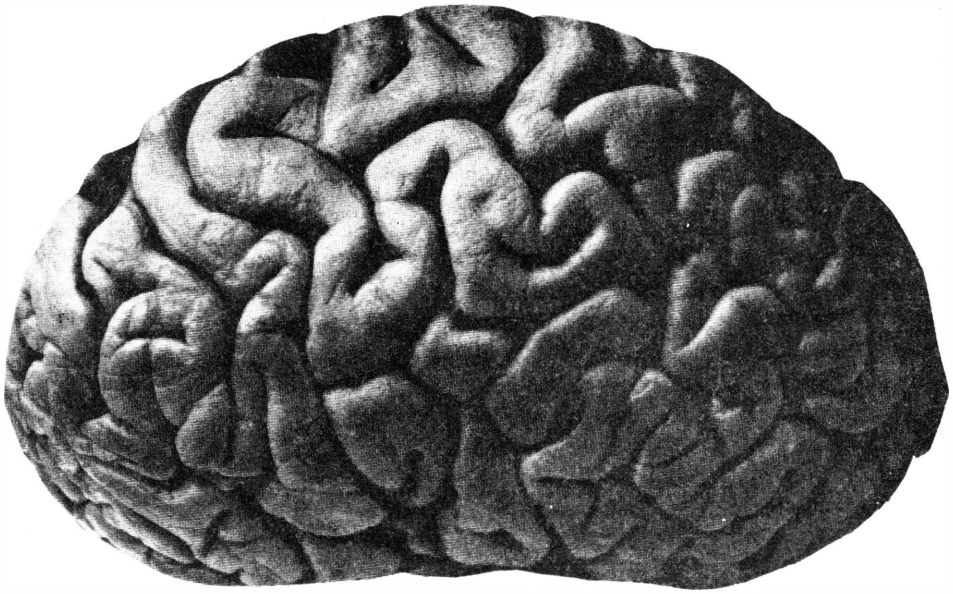
As well, we'll see how easy it can be to degbug and test our program.

(Please turn to Page 34)

NEW NEW

The BRAIN™ Is Here

DATAX introduces The Ultimate Computing Tool



DATAX is proud to introduce the most advanced computing tool available for a personal computer ever: the BRAIN. This Assembly language program is a breakthrough in both capability and user friendliness. The program is controlled by a set of 24 menus organized in a tree-like pattern. This huge program contains routines for converting numbers in five number base systems: decimal, hexadecimal, octal, binary and base-4, there are ASCII tables in both decimal and hex, and tables with the TMS 9900 Instruction Set thus making the program a very useful tool for programmers. The BRAIN also contains routines for computing financial and real estate investments such as: interest, interest rate, time periods, present value, and future value. A large portion of the program contains routines for performing advanced computations such as: vectors, exponents, logs in any base, factorials, areas and volumes, and complicated trajectories and physics equations. There are 53 routines for performing conversions on area, degrees, radians, grads, length, power, force, energy, presure, speed, temperature, capacity, and weight. The program is a joy to use: no complicated key sequences to remenber and no awkward functions. A very fast access five operation calculator window is available at the touch of a function key. Even though the BRAIN is the most user friendly program on the market, there are 18 HELP screens available just by pressing a key. The BRAIN is a real number cruncher, it can handle numbers with up to 100 digits and up to 12 decimal places. The program defaults can be changed without having any programming experience, the new defaults are saved to disk, and automatically read in at loading time, thus saving wear on the user. The program uses 40 colum display. Time will prove this program to be the most useful software product ever developed for TI99/4A. The program comes with a lifetime warranty as well as user support. The manual is enclosed in a high quality hard cover binder. System requirements: TI99/4A computer, disk drive, 32K or more memory, and Extended Basic.

Order yours today for the introductory price of $49.95. Ckeck, M.O., C.O.D.

Datax 1923 LINDEN STREET, RIDGEWOOD NEW YORK 11385 TEL. #718-417-0165

Checkbook Reconciliation Program

```
100 REM ********************
110 REM * CHECKBOOK        *
120 REM * RECONCILIATION   *
130 REM * PROGRAM          *
140 REM * by Emile Verkerk*
150 REM * for MICROpendium*
160 REM * Version 1.0      *
170 REM ********************
180 REM * THIS IS THE MAIN*
190 REM * MODULE AND CALLS*
200 REM * ALL OTHERS       *
210 REM ********************
220 GOSUB 260
230 GOSUB 740
240 GOSUB 830
250 GOTO 220
260 REM ********************
270 REM * THIS IS THE     *
280 REM * INITIALIZATION *
290 REM * MODULE          *
300 REM ********************
310 CALL CLEAR
320 DIM AMOUNT(50),BANK(15),
DATE$(50),COMMENT$(50),SIGN$
(50),COM(15)
330 TRANS=1
340 BALANCE=0
350 GOSUB 1080
360 LINE$="CHECKBOOK RECONCI
LIATION"
370 ROW=3
380 COL=4
390 GOSUB 3330
400 LINE$="****************
*******"
410 ROW=4
420 GOSUB 3330
430 LINE$="ARE YOU USING"
440 ROW=6
450 GOSUB 3330
460 LINE$="1 CASSETTE"
470 ROW=8
480 COL=5
490 GOSUB 3330
500 LINE$="2 DISK"
510 ROW=10
520 GOSUB 3330
530 GOSUB 3430
540 IF (KEY<49)+(KEY>50)THEN
 530
550 IF KEY=49 THEN 570
560 IF KEY=50 THEN 590
570 DEVICE$="CS1"
580 GOTO 600
590 DEVICE$="DSK1."
600 LINE$="READ IN STORED DA
TA? (Y/N)"
610 ROW=14
620 COL=3
630 GOSUB 3330
640 GOSUB 3430
650 IF KEY=78 THEN 680
660 IF KEY=89 THEN 690
670 GOTO 640
680 RETURN
690 IF DEVICE$="CS1" THEN 70
0 ELSE 720
700 GOSUB 1150
710 RETURN
720 GOSUB 1210
730 RETURN
740 REM ********************
750 REM * THIS IS THE     *
760 REM * PROCESSING      *
770 REM * MODULE          *
780 REM ********************
790 GOSUB 1270
800 GOSUB 1490
810 GOSUB 2720
820 RETURN
830 REM ********************
840 REM * THIS IS THE     *
850 REM * END OF JOB      *
860 REM * MODULE          *
870 REM ********************
880 CALL HCHAR(7,1,32,576)
890 LINE$="SAVE FILE? (Y/N)"
900 ROW=8
910 COL=8
920 GOSUB 3330
930 GOSUB 3430
940 IF KEY=89 THEN 970
950 IF KEY=78 THEN 990
960 GOTO 930
970 GOSUB 3510
980 RETURN
990 LINE$="ANOTHER ACCOUNT?
(Y/N)"
1000 COL=5
1010 GOSUB 3330
1020 GOSUB 3430
1030 IF KEY=78 THEN 1060
1040 IF KEY=89 THEN 1070
1050 GOTO 1020
1060 END
1070 RETURN
1080 REM ********************
1090 REM * THIS MODULE     *
1100 REM * INITIALIZES THE*
1110 REM * GRAPHICS CHARS *
1120 REM ********************
1130 CALL CHAR(96,"0000FF000
0FF")
1140 RETURN
1150 REM ********************
1160 REM * THIS MODULE     *
1170 REM * READS IN A      *
1180 REM * CASSETTE FILE   *
1190 REM ********************
1200 RETURN
1210 REM ********************
1220 REM * THIS MODULE     *
1230 REM * READS IN A      *
1240 REM * DISK FILE       *
1250 REM ********************
1260 RETURN
1270 REM ********************
1280 REM * THIS MODULE     *
1290 REM * PREPARES THE    *
1300 REM * SCREEN FOR      *
1310 REM * INPUT           *
1320 REM ********************
1330 LINE$="                "
1340 ROW=6
1350 COL=3
1360 GOSUB 3330
1370 LINE$="          "
1380 ROW=8
1390 COL=5
1400 GOSUB 3330
1410 LINE$="      "
1420 ROW=10
1430 GOSUB 3330
1440 LINE$="
        "
1450 ROW=14
1460 COL=3
1470 GOSUB 3330
1480 RETURN
1490 REM ********************
1500 REM * THIS MODULE     *
1510 REM * ACCEPTS THE     *
1520 REM * INPUTS INTO THE*
1530 REM * PROGRAM         *
1540 REM ********************
1550 LINE$="BALANCE"
1560 ROW=6
1570 COL=6
1580 GOSUB 3330
1590 LINE$="BANK ACCOUNT NUM
BER"
1600 ROW=8
1610 GOSUB 3330
1620 FOR X=1 TO 15
```

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CHECKBOOK RECONCILIATION PROGRAM—

(Continued from Page 34)

```
1630 CALL HCHAR(10,5+X,95)
1640 GOSUB 3430
1650 CALL HCHAR(10,5+X,KEY)
1660 IF KEY=13 THEN 1700
1670 CALL GCHAR(10,5+X,BANK(
X))
1680 BANK$=BANK$&CHR$(BANK(X
))
1690 NEXT X
1700 LINE$="DATE (MM/DD)"
1710 ROW=12
1720 COL=6
1730 GOSUB 3330
1740 LINE$="AMOUNT"
1750 ROW=15
1760 GOSUB 3330
1770 LINE$="DEPOSIT/WITHDRAW
AL (D/W)"
1780 ROW=18
1790 GOSUB 3330
1800 LINE$="COMMENTS"
1810 ROW=21
1820 GOSUB 3330
1830 LINE$="TRANSACTION #"
1840 ROW=24
1850 GOSUB 3330
1860 FOR X=TRANS TO 50
1870 LINE$=SEG$(STR$(BALANCE
),1,POS(STR$(BALANCE),".",1)
+2)
1880 ROW=6
1890 COL=29-POS(STR$(BALANCE
),".",1)
1900 CALL HCHAR(6,17,32,14)
1910 GOSUB 3330
1920 LINE$=STR$(X)
1930 ROW=24
1940 COL=20
1950 GOSUB 3330
1960 DATE$(X)=""
1970 FOR Y=1 TO 5
1980 CALL HCHAR(13,5+Y,95)
1990 GOSUB 3430
2000 IF KEY=13 THEN 2590
2010 CALL HCHAR(13,5+Y,KEY)
2020 CALL GCHAR(13,5+Y,DATE(
Y))
2030 DATE$(X)=DATE$(X)&CHR$(
DATE(Y))
2040 NEXT Y
2050 AMOUNT$=""
2060 FOR Y=1 TO 10
2070 CALL HCHAR(16,5+Y,95)
2080 GOSUB 3430
2090 IF (KEY=46)*(Y=1)THEN 2
080
2100 IF KEY=46 THEN 2130
2110 IF KEY=13 THEN 2180
2120 IF (KEY<48)+(KEY>57)THE
N 2080
2130 CALL HCHAR(16,5+Y,KEY)
2140 CALL GCHAR(16,5+Y,AMT(Y
))
2150 AMOUNT$=AMOUNT$&CHR$(AM
T(Y))
2160 AMOUNT(X)=VAL(AMOUNT$)
2170 NEXT Y
2180 CALL HCHAR(16,5+Y,32)
2190 CALL HCHAR(19,6,95)
2200 GOSUB 3430
2210 IF KEY=68 THEN 2240
2220 IF KEY=87 THEN 2300
2230 GOTO 2200
2240 LINE$="DEPOSIT"
2250 COL=6
2260 ROW=19
2270 GOSUB 3330
2280 SIGN$(X)="+"
2290 GOTO 2350
2300 LINE$="WITHDRAWAL/CHEQU
E"
2310 ROW=19
2320 COL=6
2330 GOSUB 3330
2340 SIGN$(X)="-"
2350 COMMENT$(X)=""
2360 FOR Y=1 TO 15
2370 CALL HCHAR(22,5+Y,95)
2380 GOSUB 3430
2390 IF KEY=13 THEN 2440
2400 CALL HCHAR(22,5+Y,KEY)
2410 CALL GCHAR(22,5+Y,COM(Y
))
2420 COMMENT$(X)=COMMENT$(X)
&CHR$(COM(Y))
2430 NEXT Y
2440 LINE$="                "
2450 ROW=13
2460 COL=6
2470 GOSUB 3330
2480 LINE$="                "
2490 ROW=16
2500 GOSUB 3330
2510 LINE$="
 "
2520 ROW=19
2530 GOSUB 3330
2540 LINE$="                "
2550 ROW=22
2560 GOSUB 3330
2570 GOSUB 2600
2580 NEXT X
2590 RETURN
2600 REM ******************
2610 REM * THIS MODULE    *
2620 REM * PROCESSES THE  *
2630 REM * DATA IN THE    *
2640 REM * PROGRAM        *
2650 REM ******************
2660 IF SIGN$(X)="+" THEN 26
80
2670 IF SIGN$(X)="-" THEN 27
00
2680 BALANCE=BALANCE+AMOUNT(
X)
2690 RETURN
2700 BALANCE=BALANCE-AMOUNT(
X)
2710 RETURN
2720 REM ******************
2730 REM * THIS MODULE    *
2740 REM * PRINTS THE     *
2750 REM * DATA IN THE    *
2760 REM * PROGRAM        *
2770 REM ******************
2780 CALL HCHAR(7,1,32,576)
2790 LINE$="OUTPUT TO SCREEN
 OR PRINTER"
2800 ROW=10
2810 COL=3
2820 GOSUB 3330
2830 LINE$="(S/P)"
2840 ROW=12
2850 COL=13
2860 GOSUB 3330
2870 GOSUB 3430
2880 IF KEY=83 THEN 2910
2890 IF KEY=80 THEN 2930
2900 GOTO 2870
2910 GOSUB 2950
2920 RETURN
2930 GOSUB 3270
2940 RETURN
2950 REM ******************
2960 REM * THIS MODULE    *
2970 REM * SENDS OUTPUT   *
2980 REM * TO THE SCREEN  *
2990 REM ******************
3000 CALL HCHAR(7,1,32,576)
3010 FOR X=0 TO 50 STEP 14
3020 FOR Y=1 TO 14
3030 IF DATE$(X+Y)="" THEN 3
210
```

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J&KH release Titles Accelerator

J&KH Software has released "The Video Titles II Accelerator," a companion product to its Video Titles II, a video titling data base program which sells for $49.95.

As well, the company has completed publication of its final (June 1986) edition of the SXBrief Newsletter.

According to the manufacturer, the Video Titles II Accelerator allows for the entire Video Titles II data base to be loaded into the 32K memory expansion and then be presented at assembly language speed. The manufacturer says the display is so fast that a number of new features had to be added to allow for previously created title sequences to operate without having to be modified with the original program.

The manufacturer says that with the original Video Titles II program it took approximately 20 seconds to retrieve and display each title within a sequence, while the new program reduces the time to less than 1/20 of a second.

Among enhancements for timing considerations, according to the manufacturer, new options have been added to select at display time "immediate," "windowshade" and "scroll inside frame" for title changes and screen blanking. Also, the pausing seconds can be varied from 0 to 255/60 second.

The Video Titles Accelerator will sell for $24.95, the manufacturer says, but is being offered at an introductory price of $19.95 plus $2 shipping and handling.

The SXBrief Newsletter is a supplement to the Super Extended BASIC (SXB) package, covering additional topics related to SXB use.

SXB, which sells for $99.95 is a package of more than 100 assembly language subroutines invoked through regular Extended BASIC with the CALL LINK subprogram, thus allowing accelerated execution speed for users who do not know TMS 9900 Assembly Programming Language (reviewed in February 1985 MICROpendium).

One newsletter topic has been additional USRSUBs (subroutines which can be added to run-time programs).

Issues 1-6 (January-June 1984) of the newsletter are included with the basic SXB package. Purchasers are able to buy issues 7-18 (July 1984-June 1985) for $10. Issues 19-30 (July 1985-June 1986) are also available for $10. Orders for overseas airmail delivery are $15 each.

In addition to the SXBrief Newsletter, two companion disks are available at $15 each: USRSUBs on Disk, Volume 1 (covering SXBrief Newsletter issues 1-15) and Volume 2 (covering issues 16-30). The manufacturer says the USERSUBs on Disk are not a replacement for the SXBrief Newsletter in that they include all the programs and USRSUBs in the newsletters, but not the documentation.

Additional SXB products include the SXB Backup Disk ($15) and the SXB Assembly Listing ($39.95). J&KH Software repairs damaged disks of its software for $5 and says that the Backup Disk is "essential" for users who do not want to be down for any length of time without SXB. The SXB Assembly Listng includes the complete assembly listing used for the commercial version of SXB.

The manufacturer requires proof of purchase of SXB to purchase any additional SXB product and states that this requirement is already taken care of

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CHECKBOOK RECONCILIATION—

(Continued from Page 35)

```
3040 LINE$=DATE$(Y+X)&" "&CO
MMENT$(Y+X)
3050 ROW=7+Y
3060 COL=2
3070 GOSUB 3330
3080 LINE$=SEG$(STR$(AMOUNT(
X+Y)),1,POS(STR$(AMOUNT(X+Y)
),".",1)+2)
3090 ROW=7+Y
3100 COL=29-POS(STR$(AMOUNT(
X+Y)),".",1)
3110 GOSUB 3330
3120 NEXT Y
3130 LINE$="PRESS ANY KEY"
3140 ROW=23
3150 COL=10
3160 GOSUB 3330
3170 GOSUB 3430
3180 CALL HCHAR(7,1,32,576)
3190 NEXT X
3200 RETURN
3210 LINE$="PRESS ANY KEY"
3220 ROW=23
3230 COL=10
3240 GOSUB 3330
3250 GOSUB 3430
3260 RETURN
3270 REM ******************
3280 REM * THIS MODULE   *
3290 REM * SENDS OUTPUT  *
3300 REM * TO A PRINTER  *
3310 REM ******************
3320 RETURN
3330 REM ******************
3340 REM * THIS MODULE   *
3350 REM * USES HCHAR TO *
3360 REM * EMULATE THE   *
3370 REM * DISPLAY AT    *
3380 REM ******************
3390 FOR LENGTH=0 TO LEN(LIN
E$)-1
3400 CALL HCHAR(ROW,COL+LENG
TH,ASC(SEG$(LINE$,LENGTH+1,1
)))
3410 NEXT LENGTH
3420 RETURN
3430 REM ******************
3440 REM * THIS MODULE IS*
3450 REM * THE CALL KEY  *
3460 REM * ROUTINE       *
3470 REM ******************
3480 CALL KEY(0,KEY,STATUS)
3490 IF STATUS=0 THEN 3480
3500 RETURN
3510 REM ******************
3520 REM * THIS MODULE    *
3530 REM * WRITES A FILE  *
3540 REM * TO CASSETTE OR *
3550 REM * DISK           *
3560 REM ******************
3570 RETURN
```

4A Flyer

Not ready for takeoff

By JOHN KOLOEN

My first reaction to 4A Flyer was delight. Scanning the most recent Triton Products catalog my eyes seized on the blurb for 4A Flyer. But after receiving the cartridge-based program and trying it out, my initial enthusiasm turned sour. I became disappointed. After a couple of minutes at the console it became apparent that this is not the serious simulation of flying that I had hoped for. Rather, it is a relatively superficial program. Instead of teaching one something about flight—which any good flight simulator should—even those who have never flown must suspend their credulity to overcome some of its most apparent deficiencies. Chief among these is the presence of certain aerodynamic impossibilities, which leads me to question whether it should be described as a "flight simulator," as its manual states.

Prior to receiving 4A Flyer I had hopes that it would build on what John Dow started with his Model Dow-4 Gazelle program. Written in Extended BASIC, the the Dow-4 simulation is realistic in its aerodynamics but limited by its graphics and the fact that it is designed to be run out of a console and a cassette recorder. 4A Flyer comes in a cartridge, is programmed in assembly language but lacks much of the sophistication of the Dow-4 simulation.

Performance: 4A Flyer is easy to use and master. The airplane can be controlled using either the keyboard or joystick, the joystick being preferred. After plugging the cartridge in, one is prompted with a "weather option." Selecting this option may result in adding inclement weather to the flying experience. Clear weather is the normal condition, with snow, rain and heat possible via the weather option. One is made aware of the the type of weather condition by the color of the sky and ground. A blue sky and white ground, for example, means snowy weather. Of course, the various weather conditions pose hazards, such as ice forming on wings at high altitudes or a slippery runway while landing in a rain storm. (I did not have an opportunity to try out the program on a black and white or monochrome monitor. However, it makes good use of color.)

Review

Report Card

Performance ..... C–
Ease of Use ..... A
Documentation ..... A
Value ..... B
Final Grade ..... B–

Cost: $19.95
Manufacturer: Triton Products Co., P.O. Box 8123, San Francisco, CA 94128, 1-800-227-6900
Requirements: Console, monitor or television, joysticks recommended

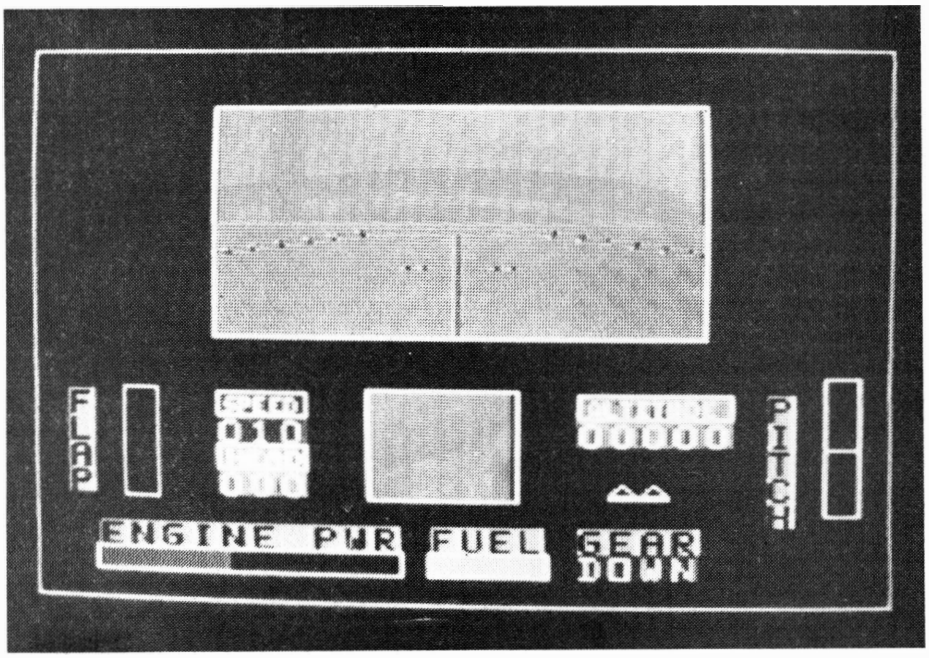
Throughout the simulation the user is faced with an instrument panel that includes an altitude indicator, pitch indicator, landing gear indicator, break indicator, artificial horizon, fuel gauge, engine power gauge, speed indicator, heading indicator, brake indicator and flap indicator.

The simulation starts with the plane at rest on a runway. Engine speed is increased by pressing the "1" key, decreased by pressing the "2" key. "I" raises the flaps, "M" lowers them; "G" raises the landing gear, ";" lowers them; and "B" applies the brake, "," releases it. Taking off is simply a matter of increasing the speed of the plane as it proceeds down the runway and pulling back on the joystick. There is no provision for "steering" the plane during takeoff or landing, another defect in the simulation.

After getting airborne, the landing gear should be raised. Then the user may go to a cruising altitude, land, or engage an enemy plane in combat. Pressing "C" initiates the combat mode, "," ends it.

A digital readout is used to keep track of one's bearings. While the plane's heading is depicted on the left side of the screen, the lower center portion includes a square that contains in-

(Please turn to Page 38)



4A FLYER—

(Continued from Page 37)

formation about the altitude of enemy planes, bearings of enemy planes and runways and the number of times one has been hit by enemy gunfire.

To engage the enemy, one presses the "C" key, and a readout on the enemy plane's location appears. The user climbs or descends to the enemy's altitude and banks to its heading. The enemy then appears in the cockpit window at the top half of the screen. Both you and the enemy are on a collision course. The sprite graphics depicting the enemy plane are quite well done. Using the joystick and fire button, the user lines up the enemy in a gunsight that appears in the cockpit window, and then fires. Hitting the enemy is tricky. I had far more misses than hits. As the enemy plane approaches, it grows larger and then, if you haven't destroyed it, it registers a hit on you and vanishes. The location of the next enemy plane then appears and you may engage it or press the comma key and disengage the combat mode. Although flak occasionally appears while engaging the enemy, it does not seem to damage either plane.

If one does not go into the combat mode, there isn't much else to do except land. Landing is accomplished by first pressing the "L" key, which results in a readout of the compass bearing of the nearest runway. (Incidentally, once you approach the runway it is not possible to abort the landing procedure.) You then descend toward the ground, reducing speed, lowering flaps and landing gear until you're a few feet off the ground. A runway then appears in the cockpit window and you try to gently touch down.

If all this seems rather matter-of-fact it's because 4A Flyer is not a very exciting simulation. Little about it is consistent. Although the program generates a noise for the engine that approximates what an engine sounds like—the pitch increasing and decreasing with engine speed—the sound used to simulate gunfire in the combat mode is dreadful. The machinegun fire sounds more like a buzzer at the end of a basketball game than a weapon.

Similarly, while the plane will self-destruct if you leave the landing gear down at speeds of 125 miles per hour or greater, it isn't possible to go into a headlong dive no matter what you do. I killed the engine at 5000 feet, pointed the nose down and watched the velocity indicator actually decrease as I descended.

It is evident that many compromises had to be made to make 4A Flyer fit in the available cartridge ROM. Even persons with only a cursory understanding of gravity would not have overlooked some of the deficiencies noted above.

But limiting oneself to the memory available in a cartridge is a problem when you are trying to write something as sophisticated as a flight simulation. But it may be a prerequisite when trying to reach as broad a market of TI users as Triton. Much of its products are aimed at users who do not have PEB boxes, and for them 4A Flyer may prove to be enjoyable. But for those with expanded systems, who are accustomed to longer and more complex programs than are generally available on cassette or cartridge, this program isn't likely to measure up to the expectations created by the program's manual or the blurb in the Triton catalog. My view is that a realistic flight simulation requires an expansion memory and disk system.

Ease of Use: 4A Flyer is easy to use. Although it is called a simulation, it performs more like an arcade game, except for the absence of scoring. (There is a readout for the number of times you are hit by enemy gunfire. However, after the third hit the plane is destroyed and you must restart.) Whatever difficulty one has in taking off or landing is quickly resolved by skimming through the manual.

Documentation: The 12-page manual is thoroughly adequate to the purpose. It is written in a style that hypes the simulation, making one anticipate that first takeoff. Unfortunately, the program is not equal to the hype.

Value: When I saw this program advertised in the Triton catalog I didn't waste a moment in placing an order. Even as I waited, Triton sent me a review copy. Clearly, Trition is excited by the market potential of this program (since the company has never sent MICROpendium any products for review in the past).

Unfortunately, I remain disappointed by it. I feel this program should not be described as a simulation, since it is obvious that it does not actually simulate the aerodynamics of flying. It is simply too superficial to be convincing. It could be more accurately described as a psuedo-simulation, or a simulation of a simulation.

I should have known by the price that 4A Flyer couldn't possibly be an improvement over the Dow-4 Gazelle.

Those who like their simulations on the tame side may find 4A Flyer to be diverting, but those who want the challenge of realism in their simulations will be disappointed.

To my knowledge, there are now three flight simulation programs for the TI, none of which utilizes an expanded system. My hope is that other programmers who may be laboring on a sophisticated flight simulator for the TI will continue their efforts. 4A Flyer clearly is not it.

TIBBS—

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TIBBS, P.O. Box 383, Kennesaw, GA 30144.

Persons wanting information on new TIBBS versions, Fowler says, may call his TIBBS at (404) 425-5254.

Fowler notes that the TIBBS represents more than three years operating and testing and that changes are not released until after six months operating and testing.

GRAM Kracker

A small box with big potential

Review

By JOHN KOLOEN

Millers Graphics GRAM Kracker is an outstanding piece of hardware that offers tremendous power to TI users. This power is available to those with minimally configured systems as well as those operating out of fully expanded systems, though those with disk drives and expansion memories have the most potential to work with.

It is difficult to know where to begin a review of a device such as this, which provides as much programming potential as most users will ever develop. With it one can actually modify the computer's operating system, make changes to cartridge-based programs such as Extended BASIC, and save them. Just exactly how far one can go depends entirely on one's ability and desire. Since it's not possible to do an exhaustive review of this product in the space provided, I will dwell primarily on GRAM Kracker's more obvious benefits. GRAM Kracker hackers may wish to supplement this review in the future with more technically oriented text.

Performance: GRAM Kracker is contained in a small, black enamled box that's somewhat longer than a Navarone Widget and about an inch high. The front face includes five control switches. GRAM Kracker plugs directly into the cartridge port. GRAM Kracker has its own cartridge port, so one can plug a cartridge in at any time. Unlike the console cartridge port, the GK cartridge port can be used to dump the contents of a cartridge into the GK memory and then onto a disk, RAM disk or other addressable device.

GK is available in several configurations. The "stripped down" unit comes with less GRAM than the fully expanded 80K GRAM Kracker. The additional GRAM costs less than $20 and is worth it. There are a number of things that cannot be done without the extra GRAM. As an example, with the 80K GRAM one can convert a Version 2.2 console into a non-V2.2 console.

Report Card

Performance ..... A
Ease of Use ..... A
Documentation ..... A
Value ..... A
Final Grade ..... A

Cost: $189 + $4 shipping and handling (80K version)

Manufacturer: Millers Graphics, 1475 W. Cypress Ave., San Dimas, CA 91773

Requirements: Console, monitor or television (memory expansion, disk system, cassette recorder optional)

This is done by loading the operating system from a non-V2.2 console into the V2.2 console. Other operating system modifications are also not possible without the 80K GRAM. For that matter, without a memory expansion one cannot load and save the console memory, though one can save and load cartridges.

The GRAM Kracker provides two action menus, depending one what one wants to do. Its main function menu allows the user to load or save modules, initialize module space (wiping out the contents of memory), load and save the console contents and edit the contents of the computer's memory. Without a memory expansion users are limited to loading and saving modules and initializing module space.

Among the most common uses that many users may have for GRAM Kracker is to load the contents of a cartridge into the GK's memory. Because GK is battery backed (the manual includes thorough instructions on how to change the battery) the contents of GK memory remains intact even when the

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GRAM KRACKER—

(Continued from Page 39

computer console is turned off. To load a different cartridge one wipes out the console memory and then loads the cartridge. All loading and saving operations are fully prompted and may be done without referring to the manual.

The memory editor that is accessed through the first menu is quite sophisticated. This operates in a similar fashion to such disk editing programs as Disk Fixer, Disko and Disk + Aid. The difference is that instead of editing the contents of a disk the memory editor allows the user to edit the contents of the computer's memory. Functions include toggling between horizontal windows, moving blocks of memory, filling a block of memory with a specified byte, paging up and down, searching in Hex and ASCII, toggling among colors, dump a block of mem ory to an output device, toggling between ASCII and Hex display and more.

A second menu is called up by selecting the load/save console option from the first menu. Here the options include load console, save console, GROM/GRAM 0, GROM/GRAM 1 and GROM/GRAM 2. The GROM/GRAM selections refer to the GROM/GRAM that may be saved. As an example, this menu would be used to save the operating system and console BASIC.

The GRAM Kracker is packed with a disk that includes a number of useful utilities. Among them are utilities that allow owners of the MG Explorer program to modify it so that it can "talk" to two types of GRAM (psuedo GRAM and true GRAM), a utility to load either the Editor/Assembler or TI-Writer from the GK very rapidly and another utility that allows E/A or TI-Writer and another cartridge to be saved together allowing the contents of two cartridges to be selected from the screen menu. Also included are a series of CALL routines, including CALL NEW, CALL BYE, CALL CLSALL, CALL CLOCK, CALL CLKOFF and CALL CAT. There are also utilities to allow the user to write BASIC programs that reside in cartridge space instead of VDP RAM, and a couple of files containing a new character set.

All of the CALL routines are available anytime the GRAM Kracker is installed in the cartridge port. I find the CALL CAT to be the most useful. This routine allows the user to catalog disks without wiping out the contents of memory. All CALLs operate out of Extended BASIC.

Ease of Use: The GRAM Kracker is easy to install. By following the manual any user should be able to start using the GRAM Kracker within an hour of unpacking it. Where you go from there depends entirely on you.

Documentation: The manual that comes with the GRAM Kracker is outstanding, showing the care and time that Miller Graphics puts into all its products. Its 55 pages are packed with information, taking the purchaser from the initial process of installing the GK to a number of tutorials on how to use it with a variety of cartridges. Included are step-by-step instructions on how to give Terminal Emulator II the ability to operate at 1200 baud, how to modify the Tax Investment Record Keeping cartridge to access the parallel printer port, how to modify the operating system so that cartridges will automatically power up rather than having to select them from a menu, how to change the color schemes in Editor/Assembler, TI-Writer, Mini-Memory, Disk Manager II, and Extended BASIC, how to chain the loading of assembly language program image files and more.

The manual also contains several pages of information about GROM and GRAM headers and other data of use to sophisticated hobbyists.

Value: I've had the GRAM Kracker plugged into my console since February and wouldn't think of disconnecting it. The only annoyances I've encountered have to do with the GROM port connection, which is common to anything that is plugged into the GROM port. Although the GRAM Kracker fits snugly and rests on rubber feet, contact with the GROM port is occasionally lost, which locks up the computer. Apparently, the GK slides out an imperceptible distance (a micron, maybe). What I do in these cases is to press the GK toward the GROM port. I feel no movement, but the connection is remade and everything works fine. Although I have no evidence to back it up, I feel that the reduction of wear and tear on the cartridge port is extending the life of the console. I have had no problem plugging in or removing cartridges from the GK cartridge port. (The cartridges plug into the port vertically.) When a cartridge is plugged in, it overrides the program that may be stored in the GK. When the cartridge is removed, the program in the GK again becomes resident.

The most annoying problem results from the location of the GROM port. Because the GK is about an inch high, my right hand constantly rubs against it while typing on the computer. Shifting slightly to the left helps to reduce this but does not eliminate it.

I don't think I can speak too highly of the GRAM Kracker. It is a superb device that can open new vistas to veteran programmers and applications hounds both. (I fall in the latter category.) I have found that the more I use it (and reread the manual) the more I am able to do with it. It is money well spent.

J&KH—

(Continued from Page 36)

for persons who either purchased SXB directly from J&KH or returned the software registration card.

J&KH notes that although newsletter publication has concluded, the company will continue to sell and support its software.

For additional information or a copy of the MICROpendium review, contact J&KH Software, 4911 So. 31st St., Arlington, VA 22206-1655 or (703) 820-4131.

Artist's Companion

A winner for TI-Artist fans

By R. PETROCONE

Recently Inscebot, Inc. released version 2.0 of their TI-ARTIST drawing program.

Along with many added features were options to utilize instances and to load and display different character sets. Instances are sections of larger pictures which can be saved or loaded independently of the master picture, similar to the clipboard of GRAPHX, with the exception that an instance in TI-Artist can be of any size unlike GRAPHX which has four set sizes. The alphanumeric entry options allow you to load character sets of any size or content. Once a character set is loaded a print text option allows you to enter text and display it anywhere on the screen.

Artist's Companion allows you to benefit from these two powerful functions without having to do any work beforehand.

Performance: Artist's Companion comes on five single sided/single density diskettes and consists of 25 character fonts, 30 large instances of varied sizes and 160 40x40 pixel instances of everything imaginable from houses to teddy bears.

The first two diskettes are occupied by the character fonts. The character fonts vary in size from 7 pixels to 32 pixels high with the average in the mid twenties. All character sets have uppercase and most have punctuation and numerals. Two character sets have a lower case.

The character fonts are really excellently done and have a good variety of styles. These are worth well the entire purchase price by themselves. There is Far East, Script, Tech, IBM, 3D and many more very useful styles . Also included are two very novel styles, Cho Cho and Plane. The Cho Cho font includes a steam train engine, caboose, and cars with the different letters on them. The Plane font has a plane with letters which form a banner pulled by the plane.

Review

Report Card

Performance ..... A
Ease of Use ..... A
Documentation ..... A
Value ..... A+
Final Grade ..... A

Cost: $17.50 ($1.50 postage)
Manufacturer: Texaments, 53 Center Street, Patchogue, New York, 11772.
Requirements: Console, monitor or television, expansion memory, Editor/Assembler, Mini-Memory, Extended BASIC, TI-Writer, CorComp manager, or Myarc Disk Controller; disk system; TI-Artist Ver 2.0; joysticks and printer optional.

The instances are stored on the last three diskettes with the third having the large instances and the fourth and fifth having the smaller standard sized instances. The large instances on the average fill about a quarter of the screen and as with the rest of this package are beautifully done. Some of the instances include a horse, clown, bird and even Dumbo and Mickey Mouse.

Most of the final 140 instances, while not as intricately done as the larger intances, are obviously well thought out objects that someone might require when drawing a picture, an amazing array of pictures that any amateur artist might need. You name it, it's there, a house, car, cat, bicycle, computer, flower, several trees and many more.

Ease of Use: Both the character fonts and instances couldn't be easier to use. For instances all that must be done is to type in the filename and then move the window. Text printing is done the same way except that you must enter the text you wish to have printed. This entire process is thoroughly explained in the TI-Artist instruction manual.

Documentation: The documentation is included on two pages and is mainly a reference document. It lists the disk number and filename (what the character set or instance is) and for character sets it lists its height in pixels and the characters included in the set. The author of each character set or instance is also listed. The documentation also gives the manufacturer's warranty which allows for the replacement of any diskette within 60 days for $2 with original diskette and dated sales receipt.

Value: Each diskette works out to cost only $3.80 each including postage. The amount of work which goes into each of these diskettes can go without saying. And their usefulness, well, if you're using TI-Artist for anything they can't help but be helpful. Definitely one of the best values on the market.

(Since writing the review, Petrocone has joined with Dave Rose, author of Artist's Companion, in producing Artist's Companion #2 for Inscebot.—Ed.)

User groups may buy videotape on Miller

The Front Range 99er Computer Club of Colorado Springs has made a VHS tape of Craig Miller demonstrating and discussing products from his company, Millers Graphics.

According to Joe Nuvolini of the group, Miller demonstrates the Millers Graphics' Explorer, GRAM Kracker, Night Mission and DISkASSEMBLER and discusses his new keyboard interface.

Nuvolini said the videotape is available to other users groups for $15 plus $2 postage and handling, payable by certified check or money order.

Orders may be placed with the Front Range 99er Computer Club, P.O. Box 9572, Colorado Springs, CO 80932.

Newsbytes

Ryte Data announces two new products

Ryte Data announces the availability of two new products, a Super Clock which supports the CorComp Triple Tech card, and a BASIC compiler package.

The Super Clock package is said to include three independent timers which can be set and read from Extended BASIC. It provides for reading of dates in text form rather than numbers only and reading of time in a 12-hour or a 24-hour mode with a.m. and p.m. listing; independent setting of week, date or time function; and two interrupt-driven utilities to display time or user-called time display for BBS application. The programs can be used in immediate mode or within Extended BASIC programs. Retail price is $17.95 U.S.

The compiler for TI is a V1.1 BASIC compiler package which includes an Extended BASIC loader, a device service routine program, a disk directory menu, and the BASIC compiler with both floating pointer and integer loader version.

This compiler is said to handle multi-statement lines and linking of compiled programs for direct execution. Retail price is $20 U.S.

Both the Super Clock and the compiler require 32K and a disk system.

For further information, or to order, contact Ryte Data, 210 Mountain St., Haliburton, Ontario, Canada K0M 1S0.

Users group seeks collaborators for fest

The Martin County 99ers report they are searching for other Florida users groups, vendors and interested individuals for the purpose of organizing a Florida TI Fest.

Persons with location suggestions or offers of assistance may contact Paul Yorke, 1200 Starfish Lane, Stuart, FL 33494 or (305) 287-1760.

Asgard releases new graphics product

Asgard Software has released GRAPHX PICTURES, a four-disk package consisting of 24 pictures by Anne Turner, Donald Hall, Edward Will and Warren Agee.

Also included is the program GRAPHX SLIDESHOW, a program by Paul Charlton, which, according to the manufacturer, allows the user to create slideshow presentations with GRAPHX for commercial or personal use.

The package requires either GRAPHX or TI-Artist v2.0, 32K and disk.

Cost is $16.50, including postage and handling. MasterCard or VISA orders may be sent on CompuServe (via EMail), to 72157,704, on Source (via SMail) to TI 9720, or by U.S. mail to P.O. Box 10306, Rockville, MD 20850.

Disk Copy 99 offered

Disk Copy 99, said to copy a full SS/SD disk in two passes, is being offered for sale by Mike Dodd of Oliver Springs, Tennessee.

Dodd says the utility initializes the copy disk if needed, uses single or multiple drive systems and allows the user to choose to copy only those sectors marked as used, resulting in a faster copy. He says it is compatible with TI and CorComp disk controllers.

The program runs out of Extended BASIC, Editor/Assembler or Mini-Memory. It sells for $20 each for from one to nine copies and $15 each for 10 copies or more, all prices postpaid.

For further information, or to order, write Mike Dodd, 116 Richards Dr., Oliver Springs, TN 37840.

BBS announced

A 24-hour BBS in the 99 BBS Version 5.1 by Mark Hoogendoorn, enhanced by Roger Davis, is operating at 300 and 1200 baud at (213) 947-7777.

Davis says it has three full disks of up/downloads and says "call for chat to change disks." Voice phone is (213) 943-7783.

For further information, contact Davis at 11410 South Grovedale, Whittier, CA 90604.

SUPERBUG II, V.2.0 released by Dohmann

Edgar Dohmann announces the release of SUPERBUG II version 2.0.

He says all of the features of version 1.0 have been retained with several improvements and new features added. New features include a String Search command, the ability to load and save program files and a GROM base change command.

The String Search command allows any area of memory to be searched for a string of up to 10 characters, according to the manufacturer. Multiple occurrences of the string will be reported, he says.

"The Program File Load will load a program file without executing it, which makes debugging such files easier than using Option 5 of Editor/Assembler in many cases," Dohmann says.

He says the Program File Save command saves memory images in a format compatible with Option 5 of Editor/Assembler without requiring the labels SFIRST, SLAST and SLOAD in the object file.

He says the GROM Base Change from TI's original debugger is added for future compatibility with hardware that may allow use of the "REVIEW MODULE LIBRARY" feature of the TI99/4A.

Dohmann says the disassembler has been improved by deleting the leading zero on registers R0 through R9 and by computing the proper values for the operand on Jump instructions, making it possible to reassemble source files directly that are generated by SUPERBUG II's disassembler.

Pathnames for list devices and pro-

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Newsbytes

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gram files can now be up to 28 characters in length, which he says provides better flexibility for those with hard disk systems. A black on white color has been added to the screen color choices, and the border colors of the screen are also set to match the background color.

Dohmann notes that the version which loads into SUPER SPACE now loads the small character set automatically. A new entry for Console BASIC is provided so the initial prompts will be visible. The "write to GRAM" feature has been changed to provide compatibility with Millers Graphics GRAM Kracker. Latent bugs in the M, D and B commands have been fixed and the operation of the Q and E commands has been improved, according to the manufacturer.

Dohmann notes that the program is still fewer than 8K bytes in lengths and the same three program versions are included on the distribution diskette. These versions are a program file that loads at >A000 with an Extended BASIC loader or Option 5 of the Editor/Assembler, a program file that loads into SUPER SPACE memory at >6000, and a relocatable object file that loads with Option 3 of the Editor Assembler. The SUPERBUG II manual has been expanded to include all new features and improvements as well as some new application hints, he says, adding that because of the manual's increased size, it will no longer be included on the distribution disk.

Price for version 2.0 of SUPERBUG II is $10. It may be ordered from Edgar L. Dohmann, Rt. 5, Box 84, Alvin, TX 77511. Dohmann says those who prefer may send $5 along with a mailer, initialized diskette and first class postage (73 cents). He says that, because of the extensive modifications to the program and manual, he is unable to offer any other upgrade service to those who have already purchased version 1.0.

Word processor for TI

Walter H. Tietjen Jr. offers a word processing program usable without TI-Writer or any of the "Miniwriter" modules or program files.

The software features separate programs for fixed or proportional spacing; six editing keys active in editors (FCTN 1—delete character; FCTN 2—begin insert mode [cancelled by FCTN 1 or any of the four arrow keys] and all four arrow keys active); fixed eight-inch line width except for centered lines; and automatic centering.

Tabulator stops are preset at 5/12 of an inch, four inches and six inches from the left margin, Tietjen says. The user presses CTRL I to move to the next tabulator stop.

The program provides for implementation of an "escape flag," he notes "because an escape sequence would foul up the on-screen spacing display.

He notes that the formatters are slow and the machine language editors will not warn the user when he is near the bottom of the page.

He says that separate XBASIC WPINPUT & PSWPIN input routines will count lines, but have a single typo correction key, FCTN V = delete last character typed. These "input" programs process each 127-character file record separately. A "buffer full" signal (low beep and cursor in the left margin of the screen) tells the user to proofread the last 127 characters on screen and press Enter to transfer the 127-character buffer to disk. Then, EDITOR or FSEDITOR must be used to correct any remaining typos.

Tietjen notes that formatters must be customized for each user.

The program requires a console, memory expansion, XBASIC, PIO, Brother HR printer, two disk drives, either the CorComp controller and manager program or the TI controller and the Editor/Assembler module. (Machine language editors will load from either the CorComp loader or E/A module loader, but are incompatible with the XBAXIC loader.)

The program is available on either a single-sided, single-density disk or a double-sided, double-density disk for $29.95 from Tietjen at 2436 Oxford Rd., Raleigh, NC 27608-1538.

TOD Editor changes

Asgard Software announces version 2.1 of TOD Editor, which incorporates changes suggested in the March MICROpendium review by Jonathan Zittrain, according to Chris Bobbitt, general manager of Asgard.

According to author John Behnke, the program already had the option to see and alter the monster graphics instead of creating them from scratch built into the supporting assembly language routines. Users can create the changes by entering the Extended BASIC environment and loading the program EDITOR off the working copy of TOD Editor, Bobbitt says. After the program is loaded, the user types in:

5271 IF @<>3 THEN 5280

and

5272 IF S$="D" THEN CALL LINK("HS",B$(Z)) ELSE CALL LINK("HS",C$(Z))

The user should then re-save the program EDITOR, Bobbitt says.

He notes some copies of version 2.0 also contain an unannounced sample game called DARK-TOWER. Version 2.1 contains all revisions of 2.0 and the new coding and two sample games.

Users not wishing to make their own revisions or who want the new sample game may return their original to Asgard Software, P.O. Box 10306, Rockville MD 20850 with a check for $2.50 to cover duplicating and mailing.

User Notes

More about ACCEPT AT

William R. Brown, of El Paso, Texas, writes: (Below) is an ACCEPT AT routine that I have worked up in

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User Notes

(Continued from Page 43)

response to the item in your User Notes, April 1986, issue, entitled Gaining Ground on ACCEPT AT.'

This routine uses the ACCEPT AT command. It starts at screen position 1,1 and continues until the buffer is completely filled or the operator has terminated the routine. This routine sets the DIM statement at 240 for console memory use; however, this may be changed to 500 for use with expansion memory. Thus, 500 lines of 28 characters each may be produced continuously. The routine also allows for the use of all the cursor movement arrows, i.e., up, down, right and left. The up arrow is a bit clumsy after line 24.

One weakness which I have not bothered to take time to remedy is that "enter" or the down arrow must be pressed at the end of each line in order to proceed with the next line.

To leave the routine press CTRL Q. To have this feature included in a program, press CTRL Q between the quotation marks of the statement IF WS$(X)=" " when you are typing in the program. This statement appears in lines 710, 740 and 790. Control Q is not a printable character and does not appear in the listing.

This routine, as written, is a standalone program or it may be enlarged to encompass such procedures as saving to a disk file or outputting to a printer, or it may be made a subroutine to another program.

The program is listed below:

```
100 ! Filename ACCEPT-AT
110 ! **********************
120 ! * ACCEPT-AT ROUTINE  *
130 ! *                    *
140 ! * by William R. Brown*
150 ! *                    *
160 ! *  El Paso, Texas    *
170 ! *                    *
180 ! **********************
190 ! Uses Extended BASIC
200 DIM W$(240):: CALL CLEAR
700 X=1
710 ACCEPT AT(X,1)SIZE(-28):
W$(X):: CALL KEY(0,K,S):: IF
 K=11 THEN 760 :: IF W$(X)="
" THEN 770 ELSE X=X+1
720 IF X<24 THEN 710 ELSE IF
 X>24 THEN 730
730 ACCEPT AT(X,1)SIZE(-28):
W$(X):: PRINT W$(X):: GOTO 7
40
740 CALL KEY(0,K,S):: IF K=1
1 THEN 780 :: IF W$(X)="" T
HEN 770 ELSE 730
750 IF X>500 THEN 770 ELSE X
=X+1 :: GOTO 730
760 X=X-1 :: ACCEPT AT(X,1)S
IZE(-28):W$(X):: GOTO 710
770 CALL CLEAR :: DISPLAY AT
(10,10):"THE END" :: END
780 X=X-2 :: ACCEPT AT(X,1)S
IZE(-28):W$(X):: X=X+1 :: IF
 X>24 THEN PRINT :: GOTO 790
790 CALL KEY(0,K,S):: IF K=1
1 THEN 780 :: IF W$(X)="" T
HEN 770 :: GOTO 720
```

Take that, Amiga, 520ST

John Hamilton of Des Moines, Iowa, writes: After taking so much guff from Commodore Amiga and Atari 520ST users about why they think their computers and my 99/4A should not be mentioned in the same sentence, I wrote an eight-line Extended BASIC program to simulate the "BOING" demo shown in the Amiga ads. Granted, it is not as fast as the Amiga ball, and the sound needs a little work, but it is more than I have ever seen on a Commodore 64 or Atari 800! Plus, it is written in BASIC (I suspect the Amiga and 520ST versions are done in assembler or C). So I toss the ball in the court of any Commodore or Atari computer owner to come up with a BASIC version, in eight lines or less, that is better than what can be done on the 99/4A!

Here is the program:

```
100 CALL CLEAR :: CALL SCREE
N(2):: CALL COLOR(12,16,15):
: CALL MAGNIFY(4):: RM,CM=6
:: RP,CP=80 :: SP=128 :: IP=
4
110 G$="FF818181818181FF" ::
 B$="030F1F3F7F7FFFFFFFFF7F7
F3F1F0F03C0F0F8FCFEFEFFFFFFF
FFEFEFCF8F0C0"
120 S1$="000010300F0F0F0FF0F
070700F0F0F03C0F0F0F00E0E0F0
FF0F0F0F00C080000" :: S2$="0
00C1C3C4343C3C33C3C3C3C03030
30300303083CC2C2C3C33C3C3C3CC
0C0C0C0"
130 S3$="030F0F0F7070F0F00F0
F0F0F30100000000080CF0F0F0F
00F0F0E0EF0F0F0C0" :: S4$="0
30303033C3C3C3CC3C343433C1C0
C00C0C0C0C03C3C3C3CC3C3C2C23
C383000"
140 CALL CHAR(123,G$,124,B$,
SP,S1$,132,S2$,136,S3$,140,S
4$):: CALL VCHAR(1,3,123,672
):: CALL SPRITE(#1,SP,7,RP,C
P,RM,CM,#2,124,16,RP,CP,RM,C
M)
150 CALL POSITION(#1,RP,CP):
: IF CP>20 AND CP<206 THEN I
F RP>4 AND RP<158 THEN GOTO
170 ELSE RM=-RM ELSE CM=-CM
:: IP=-IP
160 CALL MOTION(#1,RM,CM,#2,
RM,CM):: CALL SOUND(-50,110,
0,131,0,175,0,-8,0)
170 SP=SP+IP+IP*4*(SP=128 AN
D IP=-4 OR SP=140 AND IP=4):
: CALL PATTERN(#1,SP):: GOTO
 150
```

Here is a line by line explanation of the program:

100—clears the screen, turns it black, sets the grid colors to white on gray, sets sprites at four times normal size, initializes the row and column motion, position, sprite patttern and the increment pattern.

110—designs the grid pattern and the "background ball" sprite pattern (since the background color of a sprite defaults to transparent I had to put a second sprite behind the frist one to make the shape look like a ball).

120-130—the four sprite patterns that give the illusion of motion. A common example is a marquee that turns a light (pattern) on and off at different locations—take a look at each pattern to see how this is done.

140—assigns the grid, background

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sprite and four foreground sprite patterns, draws the grid, creates the sprites and sends them on their way (I used "SP" instead of "128" so that both statements would fit on one line).

150—checks to see if the "ball" has hit any of the four "walls." If it has, it reverses the motion variables (lRM or CM). Also, if it hit a side wall, it reverses the increment pattern variable (IP).

160—reverses the actual motion of the sprites, creates the "BOING" sound (if you use a FOR/NEXT loop you get a better sound, but screw up the timing).

170—increments the sprite pattern and checks to see if the pattern needs to be reset to simulate continuous motion—note how a mathematical formula can replace several statements of "IF THEN" coding—displays the new pattern, goes to line 150 and repeats the process.

Since lines 120 and 130 exceed the "normal" line length limit of Extended BASIC, you will need to use function REDO to enter these lines. Enter as much as you can until you hear a beep, press the enter key and then press REDO (FCTN 8). Then add the remainder of each line and press enter.

Label typer for small jobs

William J. Bullock, of Columbus, Georgia, writes: I often want to type a simple address label and return address label without having to load and mess with a word-processor. That is why I wrote this program (listed below). Of course, it could be used to enter any kind of information onto address labels. The main virtue of the program is that it is quick and easy! Additionally, it allows you to enter the maximum five lines per label and stops you if you try to enter more. It types as many labels at one time as desired. It prints return address labels without having to type the information.

Each line of information is limited to the 28 characters permitted by the ACCEPT AT command. Each line is printed immediately upon entering it so as to save time and prevent having to respond to a question as to whether or not the line is correct. Of course, this means the typist should make sure the line is correct before pressing enter. If a mistake should occur, simply entering "N" or "n" for "next" moves to the next label, so you can start over. After a label is completed, you should enter "N" or "n" to cause the printer to move on to the next label. Instructions remain on the screen during use of the program.

The program follows:

```
100 !*** LABEL-TYPER, a simp
le program to type informati
on directly onto single-colu
mn address labels.
110 !*** The program is writ
ten in Extended BASIC and is
 set up for Epson-compatible
 printers. Replace address d
ata in line 130 with user's
own address.
120 OPEN #1:"PIO"
130 DISPLAY AT(1,7)ERASE ALL
:"--LABEL TYPER--" :: DISPLA
Y AT(4,1):"1. Make sure prin
ter is set    and labels are
 in place."
140 DISPLAY AT(7,1):"2. Type
 one line at a time.    When
 ENTER is pressed the   line
 will be printed."
150 DISPLAY AT(11,1):"3. To
go on to next label      ent
er N or n."
160 DISPLAY AT(14,1):"4. To
print a return address   lab
el and go on to next     lab
el enter  R  or  r ."
170 DISPLAY AT(18,1):"5. To
quit the program enter   Q
or q ."
180 ACCEPT AT(24,1):A$
190 IF A$="N" OR A$="n" THEN
 270
200 IF A$<>"Q" OR A$<>"q" TH
EN 220
210 CLOSE #1 :: DISPLAY AT(1
2,8)ERASE ALL BEEP:"G O O D
B Y E" :: FOR DELAY=1 TO 500
 :: NEXT DELAY :: CALL CLEAR
 :: END
220 IF A$="R" OR A$="r" THEN
 PRINT #1:"Your address line
 1":"Your address line 2":"Y
our address line 3" :: CT=3
:: GOTO 270
230 PRINT #1:A$ :: CT=CT+1
240 IF CT=5 THEN DISPLAY AT(
22,1)BEEP:"NO MORE LINES PER
MITTED!":"NEXT LABEL IS NOW
IN PLACE!":"PRESS <ENTER> !"
 ELSE GOTO 180
250 CALL KEY(0,K,S):: IF K=1
3 THEN DISPLAY AT(22,1):"
                         " ::
 GOTO 270 ELSE 250
260 GOTO 180
270 FOR I=1 TO 6-CT :: PRINT
 #1: : :: NEXT I :: CT=0 ::
GOTO 180
```

BASIC converter problems solved

Several readers have provided solutions to the "but" in February's BASIC Converter program. Here are two of them, from Roger H. Klatt of Pueblo, Colorado; and David Whitcombe, of Manhattan Beach, California. Whitcombe notes that the program will run out of Mechatronic Extended BASIC II by changing the CALL LINK("POKEV",...) to CALL VPOKE(...).

Klatt pinpoints the problem as a missing CALL VDPUTIL2 at the start of the program (after it is MERGEd with VDPUTIL2), and that line 32730 "has 04 in it, which has to be wrong. I'm not smart enough to know whether it should be 0,4 or whether the zero should be eliminated. And last, line number 32739 is missing altogether. (The missing line appears to be caused by a resequencing problem—Ed.) I have run the program both with 0,4 and with only the four in line 32730. It seems to make no difference. It is extremely slow, three minutes for some programs to initialize is not unusual, and that is unfortunate because it could be very useful otherwise."

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User Notes

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As for line 32730, we have seen several versions of this program and all of them use 04. We would appreciate a User Note to clarify this point. Also, as reader Roger Carmany informed us, the problem that others have had running the converter program have nothing to do with the brand of disk controller one is using. However, an expansion memory is required—Ed.

WORDCOUNT updated (already)

Robert M. Carmany, of Greensboro, North Carolina, has updated last month's WORDCOUNT program.

He writes: I have modified the program substantially to take advantage of Extended BASIC's superior error handling facility as well as incorporating multi-line statements and the use of DISPLAY AT instead of PRINT. I also modified the text file input by adding "DSK" and a message across the bottom of the screen. These two modifications were strictly cosmetic. For those who want to check more than one file, an option to access a second (or subsequent) file was also added.

Listed below are the modifications Carmany has suggested. Refer to the April User Notes section for the entire program.

```
320 DISPLAY AT(5,2)ERASE ALL
:"Enter Text File Name" :: D
ISPLAY AT(10,7):"DSK" :: ACC
EPT AT(10,10)SIZE(12):D$
330 ON ERROR 560
340 DISPLAY AT(23,1):"FILE I
NPUT IN PROGRESS. ."
350 OPEN #1:"DSK"&D$,INPUT ,
DISPLAY ,VARIABLE 80
360 LINPUT #1:A$
370 IF EOF(1)=1 THEN 520
380 IF E=1 THEN 440
390 FOR B=1 TO 20
400 IF POS(A$,B$(B),1)=1 THE
N 370
410 NEXT B
420 E=1
430 FOR B=1 TO LEN(A$)
440 C=ASC(SEG$(A$,B,1))
450 A=((C>64)*(C<91))+((C>96
)*(C<123))+((C>47)*(C<58))+(
C=39)
460 IF A=0 THEN 480 :: D=1 :
: GOTO 490
470 IF D=0 THEN 490 :: W=W+1
 :: D=0
480 NEXT B
490 D=0 :: IF A=1 THEN 510 :
: GOTO 370
500 W=W+1 :: GOTO 370
510 DISPLAY AT(12,1)ERASE AL
L:"There are about" :: DISPL
AY AT(12,17):W :: DISPLAY AT
(12,21):"words" :: DISPLAY A
T(13,1):"in the Text File en
tered"
520 FOR DELAY=1 TO 1000 :: N
EXT DELAY
530 DISPLAY AT(17,1):"Anothe
r Text File? (Y/N)" :: ACCEP
T AT(17,26)SIZE(1)VALIDATE("
YN"):CHOICE$
540 IF CHOICE$="Y" THEN RUN
ELSE STOP
550 CALL SCREEN(7):: DISPLAY
 AT(23,1)BEEP ERASE ALL:"DRI
VE/FILE NAME ERROR" :: FOR D
ELAY=1 TO 500 :: NEXT DELAY
:: CALL SCREEN(8):: RETURN 3
30
560 END
```

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